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ABSTRACT

Nine papers on Yupik Eskimo prosody systems are presented. An introductory section gives background information on the Yupik language and dialects, defines prosody, and provides notes on orthography. The papers include: "A History of the Study of Yupik Prosody" (Michael Krauss); "Siberian Yupik and Central Yupik Prosody" (Steven A. Jacobson); "Supplementary Notes on Central Siberian Yupik Prosody" (Krauss); "Accentuation in Central Alaskan Yupik" (Osahito Miyaoka); "Prosody in Alutiiq" (Jeff Leer); "Evolution of Prosody in the Yupik Languages" (Leer); "Toward a Metrical Interpretation of Yupik Prosody" (Leer); "Sirenikski and Naukanski" (Krauss); and "Seward Peninsula Inupiaq Consonant Gradation and Its Relationship to Prosody" (Lawrence D. Kaplan). Two maps indicating regional language distribution are provided. Contains 135 references. (MSE)

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Yupik Eskimo Prosodic Systems: Descriptive and Comparative Studies

Edited by Michael Krauss

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Papers by
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Steven A. Jacobson
Osahito Miyaoka
Lawrence D. Kaplan

Alaska Native Language Center
University of Alaska
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Corrigenda to (as of 8/16/90)
Yupik Eskimo Prosodic Systems
Alaska Native Language Center Research Papers No. 7

p. 1, paragraph 3, line 4
for Koniag, read Chugach

p. 9, line 1
for antipenult and preantipenult, read antepenult and preantepenult

p. 21, line 3 from bottom
for [páqnáksaqú·naku], read [páqnáksaqú·naku]

p. 23, lines 21, 28-29, 33, p. 204, lines 17-22
The Yupik substratum underlying Bering Strait Inupiaq consonant weakening was not specifically that of modern Unaliq or Norton Sound CAY, but rather that of some form of Yupik no longer spoken, specifically intermediate between CSY and NS–CAY. Unlike NS–CAY, it also lacked the rule (given on pp. 30 as 6b and 7, on p. 58 as Rule III, and on p. 145 as L | H | FD) valid for all Alaskan Yupik, whereby e.g. ikayuqaanga 'he has me as a helper' is realized [iká·yúq·á·ga], with gemination of-q- and stress on -yuq-; cf. e.g. King Island alakaaaga 'he checked on me' from underlying alakaġaaga, with weakening of -ġ- in the same position as stressed syllable-final geminated in Alaska Yupik, including NS-CAY.

p. 52, footnote 4
–|–|– hyphenation twice

pp. 67 and 69
running heads on wrong sides of pages

p. 67-71
insert symbol # at end of examples (32), (37), (53)
insert symbol # after arrow in examples (36), (39), (40), (42)

p. 105, line 2
last two letters of first word italic

p. 129, lines 7, 8, 13 from bottom, and p. 130, lines 5, 6, 7, 16
in examples 'big road' and 'big reader,' for tə and te, read t̥ə and t̥e

p. 131, paragraph 2, lines 5, 6
for Xe(C) and Xé(C), read X̥e(C) and X̥é(C)

p. 132, line 3 from bottom
for te in niú | 'a | te | kutár | lukú, read t̥e

p. 136, footnote 2
delete ENVIR (instead of a slash, for "in the environment"),

p. 145
note that these two rules are operative in Alaskan Yupik but not in BSI, which has the same rule SY (bottom of 139)

p. 150, paragraph 5, line 5
after ←read instead *[íq.ɬum.:á]

p. 162, line 2 of text
insert "a non-final syllable"

p. 170, bottom, first example
read instead ag'kutartuanga

p. 188, diagram
adjust leftmost arrow to point vertically upward from ii to ii; see diagram A

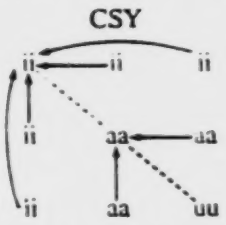
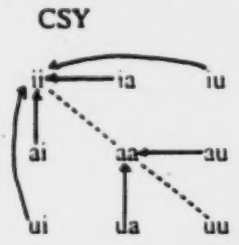
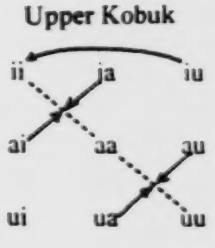


Diagram A

Diagram B

Optionally add to Naukanski pattern a second dotted line on axis slightly closer to vertical, to indicate phonetic results, approximately [eæ] and [oɔ] as described on p. 183; see diagram B. More explicitly, showing the same arrows extending from the underlying forms to the phonetic output, the entire diagram might be presented as follows:





p. 190, note

August, 1990 — Immediately after the publication of this volume, Krauss had the opportunity to work with a speaker of Naukanski, Antonina Verbitskaya, in Moscow, December, 1985. He is deeply grateful to her and to Mikhail Chlenov for this opportunity, which disclosed that the prosody of Mrs. Verbitskaya's speech was rather different from that expected from the foregoing discussion. Most briefly, there are three types of stress placement: 1)general tendency for stress on any heavy syllable (short closed as well as long); 2)stress sometimes on penult, syntactically determined, not word-level stress; 3)word-level stress on second syllable (if first not long), along with the stress on first if short closed. Thus the only Yupik-specific word-level stress is this third type, which we tentatively interpret probably as a vestige of the basic Yupik alternate-syllable stress, rather than as an incipient form of it. We thus have an example here of a decrease in complexity of the Yupik prosodic system, instead of the more widespread elaboration of it; significantly, however, original vowel length is well preserved, showing the separateness of the prosodic system, perhaps with influence of Inupiaq. An example form is qìqmíɣaraɣasùxłuraraɣáqa 'my nice poor little doggie,' where ` is closed-syllable stress, and ´ is the vestigial alternate-syllable stress, and ◌̀ is the sentence-level stress. Stress is quite absent on the fourth and eighth syllables, proving the inoperativity of the alternate syllable stress beyond the second syllable.

Further, to page 187. The Yupik forms in the Merck text are, as Chlenov (p.c., December, 1985) points out, indeed Uwelenski (as specifically designated in the text), then, since they are very similar to or the same as Chaplinski, Uelenski must be considered a variety of CSY, thus spoken discontinuously along the coast from Chaplino to the Arctic Ocean, with the interruption of Naukanski (besides Chukchi); or rather, continuously, if one chooses, perhaps with very good reason, to consider the East Cape promontory including Naukan, part of a different topography and ecosystem, "practically a third Diomede."

p. 192, line 2 from bottom
for Jeffrey, read Jeffry

p. 216, line 2
for *Languages*, read *Language*

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Map 1. This map provides geographic information relevant to the papers in this volume, including the toponyms mentioned, and definition of the language and dialect areas. • indicates an inhabited site; ○ indicates an abandoned site. The map is contemporary. See Map 2 (page 174) for details of older Siberian Yupik language distribution.

INTRODUCTION

Michael Krauss

1. A major phonological difference between Eastern Eskimo (Inuit) and Western Eskimo (Yupik) is in the complexity of word-level prosodic phenomena in Yupik, particularly duration and stress, that is unheard of in Inuit. Inuit has long been known for a relatively simple and straightforward system of contrasts (reminiscent of Finnish, for example) between long and short vowels, and long and short (two or one) consonants, at a well defined surface level, rather distinct from and largely unaffected by whatever stress, pitch or other features that may be superimposed in higher-level prosody.

Yupik word-level prosody, on the other hand, we have only recently begun to understand at all well, for reasons that will become obvious here. In Yupik we encounter everywhere shifting vowel length and stress, sometimes also consonant length, and in places also a number of other attendant processes (e.g. consonant gradation, weakening, fortition, sonorant stridentization, fricative devoicing, vowel overlengthening, shortening of long vowels with stress or pitch becoming distinctive, vowel devoicing, deletion and insertion of ə), in lively synchronic interaction, such that prosody has long been a stumbling block even to observationally adequate transcription of Yupik, and, on the practical side, to good orthographical design for it, not to mention understanding of its morphophonemics.

To take some simple examples: alternations such as Central Siberian Yupik [akí·simá·ŋisí·-maká·ŋa] 'he didn't have an answer for it' and [akí·sí·maŋí·simá·kaŋa] 'he didn't put a pillow under it' (orthographically *akisimangisimakanga* and *akisiimangisimakanga*) are inconceivable in Inuit; or Koniag Pacific Yupik [iʔú·ka] 'my leg', [íɣ·ua] 'his leg' (orthographically *iruka*, *irua*), though conceivable at a much deeper level in Inuit, must obviously be explained at a most elementary level of Yupik grammar.

2. By Yupik prosody in this volume we therefore mean the features and processes in the phonology of the modern Yupik languages that have to do above all with vowel length, stress, and phenomena directly related to these (e.g. consonant length and the others mentioned above). These are extremely prominent at word level in the modern Yupik languages, and we shall confine our discussion largely to this level. (I shall mention here, however, that Anthony Woodbury has important ongoing research in discourse-level prosody for Central Alaskan Yupik, which will certainly make a relevant further contribution to the subject of Yupik prosody. See Woodbury 1981b, 1983, 1984a; most recently and extensively, in draft received just before this went to press, 1984b. For references throughout, see list at the end of this volume.)

Apart from the prosodic phenomena so pervasive in Yupik surface phonology, prosodic phenomena have also warranted attention as a central problem in Eskimo historical linguistics, involving particularly consonant length or gemination and stress, as well as vowel length, in the explanation and reconstruction especially of Proto-Inuit phonology, and ultimately (though understandably fewer have tackled it) that of Proto-Eskimo and Proto-Eskimo-Aleut. These problems have been addressed in recent years especially by Ulving (1953, 1954), Bergsland (especially 1959b:8-10), Rischel

(1974:280-300), Elmegård Rasmussen (1979), Kaplan (1981, 1982a, 1982b), and others. In this volume, however, we are concerned mainly with the prosody of (all) the Yupik languages (including Sirenikski), from a synchronic and also historical point of view, towards Proto-Yupik. We are also concerned with Inuit, but mainly as this has been affected by diffusion from Yupik in the Seward Peninsula dialects of Inupiaq. These are the subject of Kaplan's paper here, in which however some of the implications for Proto-Inuit and Proto-Eskimo are also discussed.

3. We are indeed aware that prosody has become a subject of central interest in current phonological theory, especially as it has developed during the 1970s from a more or less linear theory towards a more hierarchical or multi-dimensional one. We recognize that in the development of our own approach (or rather approaches) to Yupik phonology these more recent developments in phonological theory are by no means fully reflected. At the Alaska Native Language Center our scientific responsibility and preoccupation has been essentially to document Alaskan languages (consonant also with our practical and educational purposes). With regard to Yupik prosody, a subject for which publication is long overdue, we now believe that our documentation is adequate for a coherent presentation of the facts, sometimes quite complex, of all the Yupik languages and dialects thereof which are found in Alaska. (This leaves only Naukanski and Sirenikski in the USSR, for which we do not have adequate documentation or access, and which I myself shall discuss in a separate chapter in this volume.) Our main goal here is to present the facts of Yupik prosody in a usefully organized way, both descriptively and comparatively. We believe that there is much here, in these extraordinarily rich systems, that may be found interesting and challenging to current phonological theory. We hope and expect, in fact, that current theory may explain the facts presented here more insightfully than we have; we would indeed welcome such an undertaking.[1] Here, in any case, are the facts of Yupik prosody, as far as they are now known to us, not only for the science of language, but also the documentary record itself, and for the value they may be to the practical study and cultivation of the Yupik Eskimo languages.

4. The five writers represented here are colleagues (four at the Alaska Native Language Center, Miyaoka at the Tokyo University of Foreign Studies). However, the papers were written quite independently, and our goal has by no means been to standardize our views or to achieve agreement on anything but the facts themselves. The approaches here remain rather varied; in fact they became, if anything, increasingly divergent over the years during which the basic research and conception of these papers took place.

One may note, however, a correlation in approach particularly with regard to the use of the concept of the metrical foot on the one hand, and, on the other hand, the degree of complexity of the prosodic system of the form of Yupik that is the central interest of the writer. Central Siberian Yupik prosody is by far the simplest, Central Alaskan Yupik is intermediate, and Pacific Yupik is by far the most complex. Krauss's main concern was Central Siberian Yupik, the prosody of which was easy enough to explain (Krauss 1975) without recourse to the metrical foot. Jacobson deals with Central Siberian Yupik and the full range of Central Alaskan Yupik dialects, also without recourse to the metrical foot, but with results that he shows are less satisfying as an optimal explanation for Central Alaskan Yupik prosody to the extent that the approach is confined to a strictly linear one. Miyaoka, whose attention here is concentrated on General Central Yupik, began approaching its prosody in terms of the metrical foot already by 1968 (Miyaoka 1970). Leer, whose main work has been with Pacific Yupik, has found his own idea of the metrical foot indispensible for coping with those systems; he had only begun to use it in the first versions of his comparative survey of Yupik prosodies in 1976-

[1] We note that Central Yupik prosody as reported at an earlier stage of research (Miyaoka 1970, Reed, et al. 1976), has already attracted some theoretical attention (Hendrick 1982; Zubizarreta 1980; note also Woodbury, especially 1983, 1984a, 1984b). With the broader presentation of the Yupik prosodic data herewith available, we may hope that the subject may become yet more attractive.

77. Krauss's paper on Naukanski and Sirenikski prosody, like Central Siberian Yupik also less complex than the Alaskan systems, but with problems quite different from the other languages treated here, is primarily philological.

Leer's longest paper here, that on Pacific Yupik (Alutiiq) prosodies, is also expectably the most difficult. Leer has undertaken to describe not only by far the most complex prosodic system, but also to describe the dialectally different systems of Pacific Yupik together, which admittedly adds several dimensions to the complexity. The alternative of treating them separately however, would have increased the paper in length into the book it some day deserves to become. For overlap, as well as differences in approach, Jacobson's and Miyaoka's papers warrant a special note. Jacobson's contribution covers Central Siberian Yupik and the full range of Central Alaskan Yupik dialects, but with a concern including prosody in connection with morphophonemics, especially the phenomenon of initial closed syllable weight (stress in Central Alaskan Yupik, vowel lengthening in Central Siberian). Miyaoka, on the other hand, with a very different approach, as mentioned, concentrates on the most widespread dialect of the language, General Central Yupik, and deals far more extensively with enclitics (and junctures, and definitions of the word) than does Jacobson.

Whatever problems remain, it is certainly safe to say that far more information is available herewith than was before on Yupik prosody.

5. For the present purposes, and perhaps for Eskimo-Aleut linguistics more generally, I shall define the Eskimo languages as follows:

> *Inuit*—a complex dialect continuum extending from Norton Sound, Alaska, through Canada and Greenland. The status of this continuum as a separate branch of Eskimo is still clear, though where internal language boundaries, if any, belong in it is much less clear. Such questions are not at issue here, but the Seward Peninsula dialects of *Inupiaq*, as the language is called in Alaska, exhibit phenomena directly related to Yupik prosody, and are the subject of Kaplan's article in this volume.

As opposed to Inuit we have another branch of Eskimo, *Yupik*, which we here define as four languages, as follows:

> 1) *Pacific Yupik* (also known as Pacific Gulf Yupik, Suk, Sugpiaq, Sugcestun, and, most currently, Alutiiq; in Alaska popularly called "Aleut," along with Aleutian Aleut). Pacific Yupik is clearly divisible into two main dialects, Chugach (Prince William Sound and Kenai Peninsula) and Koniag (Kodiak Island and Alaska Peninsula). The total population for this group is approximately 3,100, with about 900 speakers, of whom none are children.
>
> There is considerable dialectal diversity within Pacific Yupik, in matters of prosody as well as in other respects, as we shall see in Leer's paper in this volume. However, also in the very complexity of its prosody Pacific Yupik is rather sharply delineated, and distinct from Central Alaskan Yupik, with which it has, according to our experience, rather low (initial) mutual intelligibility. This might also be partly because of the apparent disappearance during the early historic period of "Aglurmiut," or the like, a dialect of the Bristol Bay area, which may have been intermediate between Pacific Yupik and Central Alaskan Yupik. Its disappearance may well have created a boundary that is this sharp only in recent times.
>
> 2) *Central (Alaskan) Yupik (Yup'ik)* is spoken from Bristol Bay to Norton Sound in about 65 villages, clearly a single language. Dialects prosodically divergent from what we call General Central (Alaskan) Yupik (GCY) are Hooper Bay-

Chevak (HBC), Nunivak Island, and Norton Sound (formerly spoken all around Norton Sound to past Golovin on the north shore, but now on the north shore only at Golovin and Elim). The total population for this group is approximately 18,000, with perhaps 13,000 speakers, of whom many are young children, especially in the central coastal and lower Kuskokwim drainage area.

3) *Naukanski* or East Cape Siberian Yupik. This was formerly spoken mainly at Nevuqaq (Yupik name) or Naukan (Russianized Chukchi version) on East Cape, USSR, since 1958 evacuated and dispersed, now especially to the modern town of Lavrentiya; the total population is perhaps 350. The number of speakers is perhaps now 150, of whom very few or none are children. We have been able to test the intelligibility of Naukanski to speakers of both Central Alaskan Yupik and Central Siberian Yupik (St. Lawrence Islanders) from a tape recording of the Naukanski storyteller Nututein reciting a familiar story. Even that was only partially intelligible to speakers of both these other Yupik languages, who had never heard Naukanski before. Interestingly, speakers of Central Alaskan Yupik understood about as much as the St. Lawrence Islanders. This further confirms the intermediate position of Naukanski, and the expected basic prehistoric configuration of Yupik geography, wherein Alaskan Yupik was connected to Asiatic through Seward Peninsula and Bering Strait. (This continuity was then interrupted by the takeover of most of Seward Peninsula by Inupiaq, historically ongoing, still leaving behind the Golovin-Elim pocket, and showing strong traces of a Yupik substratum, interestingly enough above all of Yupik prosody, as we shall see in Kaplan's paper in this volume.)

4) *Central Siberian Yupik* (CSY) consists of two groups: Chaplinski in the USSR, now mainly at New Chaplino and Sireniki; Chaplinski is nearly identical with the language of the other group, the people of St. Lawrence Island, Alaska. The Soviet population is perhaps 900, with 500 speakers, very few or none of whom are children; on St. Lawrence Island the population is 1,000, almost all of whom are speakers, including children.

Sirenikski is a sixth Eskimo language, with but two elderly remaining speakers, as of 1980, at Sireniki, USSR. The position of this last Eskimo language is especially problematical, as we shall see. Recognized by Gondatti-Miller (1897) and Menovshchikov (1964:5) as a distinct Asiatic Eskimo language, we now consider Sirenikski not only a separate language, but at least a separate branch of Yupik (as opposed to Central Siberian Yupik, Naukanski, Central Alaskan Yupik, Pacific Yupik), if indeed it is even to be considered Yupik at all. From a point of view of prosody, beneath a Chaplinski veneer it is profoundly different from any other Yupik, to the point that it should perhaps be classed even as a separate branch of Eskimo itself. The Eskimo language family would then consist of three branches (Inuit, Yupik, Sirenikski), or from a purely prosodic point of view, perhaps only two branches, but in that case with Inuit-Yupik as one, and Sirenikski the other.

To sum up, the Yupik branch of the Eskimo language family consists of at least four distinct forms, which we here shall call Pacific Yupik, Central Alaskan Yupik, Naukanski, and Central Siberian Yupik, linked in that geographical linear order also in terms of their linguistic relationships in the prehistoric Yupik continuum. By the standards of mutual intelligibility (without practice) which define Spanish, Portuguese, and Italian, for example, as different languages, then surely these four forms of Yupik should also be considered different languages. Sirenikski would then be not only a fifth Yupik language, but also at least a separate branch of Yupik itself, or a separate branch of Eskimo.

6. If we have occasion to speak collectively of those forms of Eskimo spoken in the USSR,

namely Sirenikski, Chaplinski (Central Siberian Yupik with or without St. Lawrence Island), and Naukanski, we may then do well to revert to the term Asiatic Eskimo, the standard Soviet label, basically a geographical designation. This also appropriately skirts the question of whether Sirenikski is Yupik at all, avoids the implication that Yupik is essentially subdivisible into Alaska and Siberian branches in any deep historical linguistic sense (given that Naukanski is approximately equidistant between Central Alaskan and Central Siberian Yupik), and even avoids the issue of Imaklikski (Big Diomede), the only Inupiaq spoken in the Soviet Union, now extinct there.

Turning now to our actual nomenclature practice, we acknowledge that the term Siberian Yupik is an unfortunate one in that the only speakers of it in the United States do not consider that name appropriate to themselves. Understandably they prefer the term St. Lawrence Island Yupik; that, however, is not only awkward but impossible for their Soviet kinsmen speaking exactly the same language. On the Soviet side too, ironically, the term Siberian is considered highly inappropriate, because the area is called Chukotka, a section of the far Soviet northeast, far beyond what in Russian is called Siberia (*Sibir'*), though in American and Alaskan English that area is definitely considered to be Siberia. In this volume we shall, for want of a better term, continue to use the term Siberian Yupik to designate Central Siberian Yupik (St. Lawrence Island and Chaplinski), with or without Naukanski and even Sirenikski, especially as opposed to what we shall have occasion to refer to as Alaskan Yupik (Central Alaskan Yupik plus Pacific Yupik, which do after all share important prosodic and other traits not present in Siberian). Jacobson in particular will adhere in his paper in this volume to our parochial Alaskan practice of referring to Central Siberian Yupik alone as Siberian Yupik and Central Alaskan Yupik as Central Yupik. The name for Pacific Yupik is also a problem. I have here picked the shortest geographically explicit name and shall use it throughout, acknowledging that its validity is purely academic; the people traditionally consider themselves not to be Eskimo at all, but rather (in English) Aleut, in their own language (singúlar) *Alutiiq*, the term here used by Leer throughout.

Finally, a word of explanation is also in order for our use of the term "Central" in (Central) Siberian Yupik, ((C)SY), and Central (Alaskan) Yupik (C(A)Y). In the 1970s, as we viewed Yupik for our Alaskan purposes as consisting of two branches, Alaskan and "Siberian," ignoring the subdivisions of Siberian, and emphasizing the subdivisions of Alaskan, we found Central Yupik highly appropriate and readily acceptable as the name for the Yupik language which lies linguistically and geographically between Sugpiaq (Alutiiq) and Siberian (St. Lawrence Island) Yupik in Alaska. However, for more academic linguistic purposes, in order to differentiate also the varieties of Siberian Yupik, because of the intermediate position of Chaplinski, geographically at least, between Naukanski and Sirenikski, and the need for a term to include St. Lawrence Island along with Chaplinkski, the name Central Siberian Yupik was a natural choice. "Central" then had the advantage for both countries of designating also numerically the largest and best documented of the three varieties of Yupik in each country, as well as the intermediate one, for Alaska that between Pacific Yupik and St. Lawrence Island, and for the Soviet side that between Naukanski and Sirenikski. This point of view is admittedly inconsistent with that of this book; where we see Sirenikski as a separate branch of Yupik if not of Eskimo itself, leaving Chaplinski (with St. Lawrence Island), if intermediate at all by no means equidistantly so, but much closer to Naukanski than to Sirenikski, and where we see Naukanski as intermediate between Chaplinski (with St. Lawrence Island) and Central Alaskan Yupik, as part of a chain, linked in the order "Central Siberian" Yupik, Naukanski, "Central Alaskan" Yupik, Pacific Yupik, however infelicitously named.

7. Throughout most of the papers in this volume Yupik forms are given both in the standard Alaskan orthographies of the Yupik languages and in a standard phonetic transcription. For the Pacific Yupik orthography, see Leer's "Prosody in Alutiiq," section 1.1, this volume; for the Central Alaskan Yupik, see Miyaoka, section 4.4; and for the Central Siberian Yupik (St. Lawrence Island), see Krauss 1975. The Sirenikski, Naukanski, and Chaplinski forms, and Alaskan transcrip-

tions from the Russian literature, are given by Krauss in transliteration from the Cyrillic, generally, with some obvious specialized conventions for transliterating the Cyrillic, e.g. *q* for к' (rather than *k'*), or *ł* for лъ (rather than *l'*).

The phonetic transcriptions used throughout are largely standardized for Yupik. Except as otherwise specified, [p t c k q] are voiceless unaspirated stops ([c] being approximately [tš] before [a i u], elsewhere [ts]). Velars (stop, voiced fricative, voiceless fricative, and nasal) are [k ɣ x ŋ]; likewise the uvulars [q ɣ̇ x̣ ŋ̇]. [ř] (in Alaskan transcriptions) or [r] (in Asiatic transcriptions) is a voiced retroflex (*[ẓ], a similar sound in Proto-Eskimo), the voiceless being [s̬ r̬ r̥]. The voiced lateral is undifferentiated [l] (sonorant), or [ɮ] (fricative), except as specified; the voiceless [ɬ]. Voiceless nasals or vowels are [m̥], [ə̥], etc.

The "full" vowels are [i], [u], and [a]. Next to uvulars, more or less uvularized variants of [i] and [u] are implicit. The fourth ("reduced") vowel, central, high-mid to mid, written *e* in the Alaskan orthographies, is usually represented [ə], here essentially the equivalent of [ɨ] (used especially by Krauss in transliterating the ы of the Soviet transcriptions of Naukanski and Sirenikski). Typefont limitations are the reason for roman [ŋ] and [ə] in otherwise italic forms.

Conventions for prosodic phenomena (such as the representation and interpretation of vowel or consonant length, stress, pitch, syllable and foot divisions, junctures and boundaries) are less standardized throughout this volume; they are specified as needed in the individual papers.

A HISTORY OF THE STUDY OF YUPIK PROSODY

Michael Krauss

0. Introduction: Classical languages, Inuit, and Aleut

In this paper I shall outline briefly the earlier history (1780-1968) of the documentation and analysis of the prosody of the various forms of Yupik, then summarize the work of the last fifteen years on it.[1] However, to put the Yupik history in the broader perspective of that for the prosody of Eskimo and Aleut linguistics, I shall first include here some notes on the related history of prosodic study of the non-Yupik languages of this family, namely Inuit and Aleut, and on the classical traditions which deeply influenced its early development.

0.1 The classical tradition

The diacritic symbols that are most widely used today for representing prosodic and tonal features are essentially the Greek ones from classical antiquity. Traditionally (and from the point of view that concerns us here), the Greeks distinguished three pitch accents: *oxeîa* (*prosōdía*), 'acute (accent)'; *bareîa*, 'grave'; and *perispōménē*, 'circumflex'. These were very clearly distinguished and independent from vowel quantity (short and long). This pitch accent, which later became stress, fell on any one of the last three syllables of the word. Circumflex fell only on long vowels or diphthongs, as falling tone, and grave was the variant of acute that fell on the short-voweled last syllables not before pause. The invention of the symbols themselves is attributed to Aristophanes of Byzantium (ca. 250-180 B.C.). The symbols are thus about 2,200 years old. With explicit iconicity, Aristophanes marked the quantities ˘ and ¯, and the accents *oxeîa* ´, *bareîa* `, and *perispōménē* ˆ, which he called *oxybáreia*. (See, e.g., Sturtevant 1940:94-105.)

In Latin, the accent (prehistorically on the first syllable) by classical times was on the third last of polysyllables, unless the second last was long; unlike the Greek, it was thus predictable, from the end of the word, dependent on vowel length, and not marked orthographically.

Old Church Slavonic may have had distinctive vowel length as well as independently distinctive stress or pitch accent, like Greek, but of the length there was no orthographic or diacritic representation at all. Sometimes Greek-type accent marks were used for the stress, but not consistently. In the Russian Slavonic texts first printed with the Pacific Yupik translations of the 1840s, stress was represented by ´ on any of the last three syllables, with the variant ` on the last, if open.

As we shall see here, for a long time in the transcription and description of Inuit (mainly in Greenland and Labrador, the areas of earliest contact), accent (stress and/or pitch) and quantity of vowels and consonants were not clearly distinguished. Although great progress was made during the period 1725-1805 by Kleinschmidt's predecessors, it remained for Kleinschmidt to achieve for Greenlandic what had been done for Greek by the time of Aristophanes of Byzantium—consistent

[1] In retrospect, I consider that my own two earlier articles surveying work in Eskimo-Aleut linguistics, while mentioning work on Yupik prosody (1973:809-810, 813-814, 824-825, 828-829; 1979:816, 819, 823, 825, 837), fail to do so in a coherent way and include some premature or erroneous conclusions. I hope the present paper improves the situation. (For references throughout, see list at the end of this volume.)

and accurate distinction of quantities and accent. Even then, however, Kleinschmidt continued to use the accent marks to represent the quantities, an orthographical practice which was not changed until the reform of the 1970s (by which the accent marks were abandoned and length was written VV and CC, as in the standard Canadian and Alaskan orthographies which had become established in the meanwhile). The classical (basically Greek accentual) tradition was to exercise strong influence over European perceptions and transcriptions not only of Greenlandic (and Aleut), but also of Yupik, until the middle of the twentieth century. Although the tradition undoubtedly had a positive effect in promoting awareness of prosody and interest in it, and also in providing a conceptual framework and set of symbols, the emphasis on accents instead of quantities was to prove inappropriate for Eskimo-Aleut in general, and counting right to left from the end of the word was additionally misleading in Yupik particularly.

0.2 Inuit

Inuit, as is well known, generally has a fairly simple phonotactic pattern—basically sequences of CV(V)(C); i.e., vowels and consonants alternating, with a maximum of two consonants or vowels in sequence. Vowel or consonant clusters are very frequently composed of the same segment twice (or become so composed by widespread patterns of assimilation or gemination), whereby quantity (of both vowels and consonants, as e.g. in Finnish) becomes pervasively distinctive. Superimposed on these basically simple and generally very stable phonotactics is a higher-level word accent, on the ultima, penult, or antepenult. For excellent and extended discussions of this whole subject of quantity, syllable structure, morae, and word accent, with a full review of the literature, for Greenlandic, see Rischel 1974:77-100; Petersen, 1970a, 1980; and Fortescue, who most recently (1983) extends consideration of some aspects of it (higher-level prosody) across the Inuit dialects to Alaska.

The earliest documentation we have of any Eskimo-Aleut language is of Greenlandic and East Canadian Inuit, by two English mariners: Cristopher Hall with Frobisher in Baffinland, 1576, 17 words; and John Davis in West Greenland, 1586, 40 words. Both first appeared in Hakluyt 1589:622,783. These two printed vocabularies do not have accent marks or other systematic indication of quantity or accent, but there are spellings that may indeed reflect length, e.g. Davis *Paaotyck, an oar* /paaɣutik/.

The next known lists are two from the Greenlandic women taken to Denmark in 1654—the first list by Reinhold Horrn, of about 105 words (first published by Olearius 1656:171), the second by Caspar Bartholin, of about 300 words (first published by Thomas Bartholin 1673:71-77). The latter has a few correct geminates, e.g. *Manni 'ovum'* /mannik/ and some double vowels, e.g. *Canaa 'pes'* /kanaaq/ 'shin', but no accent marks (at least in this only printed version). The former, however, has not only some correct geminates, e.g. *Nasekka 'der Bauch'* /naṣṣakka/ 'my belly', *Mekkone 'Nehenatel'* /miqqun/, but also includes a few grave accents on final vowels (1656 Schlesswig edition only), e.g. *Imè 'Wasser'* /imiq/, *Sunà 'was?'* /suna/; one (probably by chance) for a long vowel, *Kanà 'ein Bein'* /kanaaq/; and one instance of circumflex, *Konâ 'ein Weib'* (Bartholin *Cona 'uxor'*, perhaps from Icelandic *kona*).

The earliest transcriptions I have heard of, of any Eskimo with accents actually reflecting vowel and/or consonant length, are in Hans Egede's and Albert Top's early Greenlandic manuscripts (1725 and 1727; soon to be published by Bergsland and Rischel). According to Bergsland (personal communication 1983), though they make no explicit statements about accent or prosody, Egede "used ´ and `, and Top also the ˆ (probably taken from Greek), although far from consistently or even correctly." A correct example: Top *Írse* 'frost' (Kleinschmidt *ísse* /iṣṣi/) vs. *Ĭrsë* 'eye' (Kleinschmidt *isse* /iṣi/).

The first explicit statement concerning Eskimo prosody is evidently in Hans Egede's manuscript grammar of 1739 (again, for this we are indebted to Bergsland, personal communication 1984), "Grammatica Grønlandica per Johannem Egede concepta" (p.2, De Accentibus):

> They are accented on the ultima, penult, antipenult and preantipenult, concerning which reasons and rules can thus not be found.[2]

No examples are given, but throughout the text there are a few scattered acute accents, not used with any consistency: e.g. *Nuna* is both 'a land' and 'his land' (/nuna/, /nunaa/), but *nunáne* 'his (own) land' (/nunani/).

Hans Egede's son, Paul Egede, published a Greenlandic-Danish-Latin dictionary (1750), with acute accents on the Greenlandic, at most one per word (occasionally with the variant grave on open final syllables), which at least tends to correspond with the accentual peak of the word. Paul Egede's Greenlandic grammar, published ten years later (1760:6-8), makes a much more advanced and explicit statement concerning "*Accents:* They are of two types, long and short," which he writes ¯ and ´ (no `). These represent, in principle, presumably, V·C and VC·, as opposed to unmarked (VC). (However, also note *Mânna* for 'now' /maanna/.) Egede continues in the expected classical perspective, counting syllables from the end:

> *The Accents* are very important for correct understanding of the words. They can occur in the last, second last, third last, and fourth last syllable, wherefore no rule is yet evident, e.g. *Assauá Angúne tunnímane piursángvoamik* 'he loved his father, because he gave him a plaything' [*Asavâ angúne tunimane piussānguamik* /asavaa aŋunni tunimani piuṣaaŋŋuamik/]. How necessary careful attention to the *Accents* is may be seen from the following examples which are written with the same letters while having unlike or opposite meanings.

Some 17 minimal pairs for accents follow. In the printed grammar text itself, however, notwithstanding Egede's statements on their importance, there are no accent marks except once in a paradigm *Nuna* 'a land', *Nuná* 'his land' /nunaa/.

Otho Fabricius, in his Greenlandic grammar, first drafted in 1783 (about the same time as the earliest Yupik wordlists), and printed in 1791 (revised printing 1801), makes significant advances over Egede. In his discussion of "Accents" (1801:14-16), Fabricius distinguished four: unmarked (*korte*); ´ (*haarde*), with variant ` on final syllables; ˆ (*lange*); and ¯ (*slæbende*, 'dragging');[3] in principle for VC, VC·, V·C, and V·C·, stating that -

> Attention to the *Accents* is of great importance in this language, as many words are distinguished from others solely by stress [Tonefaldet] . . . A single word also can, if it is long, have several *Accents*, but one of these dominates, e.g. *Iseriártortúngoak* ('the little one who has just entered'), where the last *accent*, over *túng*, is the dominant one, though the one over *ar* also is clearly audible.

In Fabricius's text itself (and dictionary, 1804), however, the accents, though present, are not used with any high degree of precision. It remained for Samuel Kleinschmidt to put the system into consistent practice, in addition to providing a detailed and insightful description of Greenlandic syllable structure, quantity, and prosody (1851:3-4, 8-9). Kleinschmidt clearly recognized consonant and vowel quantity, which, however, he continued to represent with accents distinguishing four vowel or syllable nucleus types, by what might be called two "distinctive features," *kurz* vs. *lang*, and *stumpf* vs. *scharf* (i.e., for the latter, followed by non-geminate vs. geminate), thus VC, V̂C, V́C, V̄C for VC, V·C, VC·, V·C·, respectively. (See also Rischel 1974:26-29.) Kleinschmidt further recognized that long vowels and closed syllables bear more natural stress, and that in addition there are primary

[2] Quotations from other languages throughout this paper are in the present author's translation.

[3] The three accent marks are called in Greenlandic *sukâssut* ('tightener', *sukag-* 'tense', also *'haard; skarp'*), *sivitsût* ('lengthener'), *sukâssutaussaq* ('similar to tightener').

and secondary word-level stresses which are influenced by these segmental factors in Greenlandic prosody. Kleinschmidt by 1850 already had at least a century of tradition and much important groundwork to build on; but it is understandably Kleinschmidt's work which had the farthest-reaching influence beyond Greenland and beyond the 19th century, into Yupik study, and well into the twentieth century. Yupik prosody, however, is very different from Greenlandic or Inuit, in, among other things, counting from left to right for stress placement. Kleinschmidt's influence in this regard, particularly in predicting word-level stress (correctly for Greenlandic and Inuit) by counting from the end of the word rather than from the beginning, was thus to prove more of a hindrance than a help for the understanding of Yupik prosody, only reinforcing the classical tradition. This overwhelming agreement and misleading influence, reinforced yet again by the Slavic tradition as applied by Veniaminov to Aleut, was not to be overcome (even by Swadesh, for example) until after the Kleinschmidt Centennial (in Rubtsova's remarkable statement, 1954).

0.3 Aleut

Documentation of Aleut, particularly its prosody, began somewhat later than that for Inuit but at about the same time as that for Yupik, in the 1770s. Its history is closely related to that of Yupik, especially in that the major writing tradition for Yupik as well as Aleut began in the work of Ioann Veniaminov and his associates (ca. 1825-1845).

Aleut prosody is also much simpler than the Yupik, though in a very different way from Inupiaq. Aleut phonotactics permit double (distinctively long) vowels (a i u, aa ii uu), but no clusters of unlike vowels; it permits clusters of unlike consonants, but no distinctively long (or geminate) consonants. Eastern Aleut word prosody is relatively simple: long (double) vowels are stressed; also, unless the ultima is long, the penult (i.e. the penultimate mora), and first syllable clearly tend to be stressed, but such rules in Eastern Aleut are not so well defined as in Yupik; in Western Aleut, they seem still less so. (For succinct descriptions of Western Aleut quantity and prosody see Bergsland 1956:38 and 1959:8; there is a detailed account of Eastern in Marsh 1956:16-17, 22-24, 38, 47-61). Prosody in Aleut generally seems to be much more a matter of sentence- or discourse-level phenomena than word-level, unlike the case of Yupik.

Most of the early Aleut vocabularies, 1772-1825, show no accent marks or other indications of quantity or stress, but in some of Merck's (German) transcriptions, 1790-91, there are double vowels or macrons. Lisianski (Russian) in 1804-05 has some well-placed acute accents and even double vowels, and Rask (Danish), working with Aleut speakers in St. Petersburg in 1818, has grave and acute accents, though without consistently distinguishing therewith stress from length.

Veniaminov from the beginning wrote Aleut with accent marks (introduction to unpublished Catechism, Veniaminov and Pan'kov 1826) "˝, double accent, over vowels doubles the syllable or extends the length of that letter; ˜ ´ have the same force as in Russian"; in the text mainly ´ is used, frequently on the penult and/or on long vowels, sometimes more than one in a word; ˝ is less frequently used, not consistently distinguished from ´. In 1834 Veniaminov published a new Aleut catechism, the first book ever printed in an Alaskan language; unfortunately no surviving copy has been located. Wrangell (1839:255-259), however, describes the book and provides a German summary of the phonological introduction, which includes the information that "Veniaminov concludes with the remark that the accents (˜ ´) in the Aleut orthography are indispensable, as some words can be distinguished only by these, e.g. *ātgim* and *atgim*; *ilan* and *ilán*" (no doubt for *āmgim* 'of blood' and *amgim* 'of night', absolutive *aamax* and *amax*); we do not know how these were used in the text. In the phonological introduction, written in 1834, to his Aleut grammar (1846a:2-5), Veniaminov states, similarly, that the diacritics are indispensable for correct pronunciation, very often distinguishing words, e.g. *adán* 'thy father', *ádan* 'fathers' (*adaan* [ađá·n] vs. *adan* [áđan]), and distinguishes between two stress marks: "˜ or printed◠," which "makes the syllable much longer than ordinary stress does, e.g. кýмъâ (probably a false example, *quhmaa* 'white'; the ◠ is here the final-syllable

variant of ´), and ˙, "which makes a syllable ordinarily long, e.g. *áliq*" (*alix* 'old man'), but again in practice these are not distinguished, the former not generally used in the standard texts, and length not distinguished from stress.

0.4 Impact on Yupik

Such was the situation with Aleut in the 1840s, when Veniaminov and his associates extended their efforts to (Koniag) Pacific Yupik, which has a vastly more complex system of distinctive word-level prosody, by far the most complex prosodic system of the Yupik languages, and by far the most difficult to interpret in terms of underlying (vowel) quantity instead of accent.

(Koniag) Pacific Yupik in Russian America, was, however, the first Yupik language to be extensively documented and to be the subject of linguistic description, including explicit consideration of the prosody. Thus the first Yupik prosody to be confronted was that which the linguists involved were least prepared to hear in terms of anything but accent. The next was Central Alaskan Yupik, which also has the next most complex system. Given the accumulated influence of the Greek, Slavic, Aleut, Koniag and Greenlandic Kleinschmidt traditions, it is hardly surprising that the Central Alaskan Yupik system also resisted interpretation for so long. Still later to be seriously studied was Central Siberian Yupik, but this has the least complex prosodic system of the three, and is by far the easiest to interpret in terms of underlying vowel quantity, so it was for this language that some of the important insights about Yupik prosody were soonest achieved.

I shall generally follow this historical order—Pacific Yupik, Central Alaskan Yupik, Central Siberian Yupik—for the following treatment of the study of Yupik prosodies. For Sirenikski and Naukanski, major documentation and description became available still more recently (Sirenikski in 1964, Naukanski in 1975). The prosodic systems of these remain highly problematical and will be treated in a separate paper in this volume.

1. History of earlier study of Yupik prosody, 1780-1968

1.1. Pacific Yupik

What may be the earliest Yupik vocabulary already has accent marks written over the vowels. This was transcribed about 1780 by an unidentified Russian for the (Afognak) Koniag dialect of Pacific Yupik. It consists of about 280 words, elicited from a standard list distributed by Peter Simon Pallas for collecting data to compare all the languages of the world. We know this Pacific Yupik list only from the inclusion of the forms, each entered twice, identically, first as Koniag, then as Chugach, amongst the words of 200-odd languages, all the words listed in a single alphabetical order, other language to Russian, in four volumes (Iankovich de Mirievo 1790-91), under a title which translates as "Comparative dictionary of all languages and dialects, arranged in alphabetical order." (The only Yupik that might have been written at all earlier, that we know of, would be the very short wordlists from Prince William Sound and Norton Sound by William Anderson and James King with Captain Cook in 1778. These do not have accents.)

Since Russian has no distinctive vowel length but does have prominent distinctive lexical and morphologically mobile stress, it is not at all surprising, as implied above, that this early, unidentified transcriber of Koniag should have heard and written Yupik prosody in terms of stress. The 1780 vocabulary follows the expected pattern, one accent per word, acute if non-final syllable, grave if final. The placement otherwise seems capricious, but by 1804-5 (Captain Lisianski, Monk Gideon) Koniag transcriptions already are somewhat consistent in accent placement.

The first explicit statement concerning any Yupik prosody I have noted, however, is by Ioann Veniaminov in his brief remarks on Koniag (1846b:29): "The superscript signs for stress . . . used in the Unalaskan language are also necessary in the Kodiak." By the 1840s, as a further extension of the Aleut literature, still under Veniaminov's direction, published Russian Orthodox literature in

Pacific Yupik too was beginning to develop nicely, with significant use made of accents. Tyzhnov's Koniag primer (1848, both versions) has an interesting page exemplifying the use of the diacritics, including some (´ ` ¯) which are prosodic or partly prosodic, e.g. *macáq* 'sun' [macaq], *igáluq* 'moon' [iɣá·luq], *nunà* 'land' [nuna], *ána* 'mother' [aana], *ígaq* 'devil' [iiɣaq], *īqua* 'its end' [íq·ua], obviously an attempt to grapple with the distinctions; in the Orthodox texts the basic pattern is one acute accent per word with the variant grave on open final syllable, that accent tending to be on the last of the syllables perceived as stressed in the word. (The additional difficulty, even unreality, of hearing etymological length as synchronic length in Pacific Yupik, we shall return to later.) As in the early Greenlandic and Aleut materials, there are also a number of consonants written double, but then too these correspond only very inconsistently with actual geminates. An exception is the case of the Tyzhnov materials, where actual geminates are consistently written as double consonants, but only those at the end of the first syllable.

After the transfer of Alaska to the United States in 1867, the cultivation of this language was severely suppressed, and no further sustained work of any kind on it was to take place for a century. Further major linguistic research on Pacific Yupik thus belongs to the most recent periods only and will be treated later (1.3, 1.4).

The Russians did not learn to distinguish stress from vowel length at all in Pacific Yupik, and, as we shall see, they have still not distinguished them fully in any Eskimo or Aleut.

1.2. Central Alaskan Yupik

The Central Yupik area was a relative backwater for Russian colonization, and extensive documentation of Central Yupik began somewhat later than for Pacific Yupik. The brief vocabulary by King with Cook in Norton Sound (1778), the first and only known record of the language for over forty years, and the few Russian wordlists before 1850, showed no accent marks. The vocabularies of an English ship's surgeon, Edward Adams (1850-51), significant but mostly unpublished and only very recently known, and the major lexical work, unpublished but better known, by the Americans L.M. Turner and E.W. Nelson (1874-1881), included accent marks in the Anglo-American orthoepic tradition—division into syllables; acute at the end of accented syllables; macron, breve, circumflex indicating vowel quality or length. The one earlier Russian Orthodox Central Yupik manuscript we have (ca. 1860, possibly from the Aleut creole priest Iakov Netsvetov, but not in his hand) lacks accents, but the later Russian Orthodox missionaries (Bel'kov, Orlov) in their texts (mostly 1880-1900, printings 1896) generally used one acute accent per word (in some materials, grave if on open final). The materials of the (European) Jesuit missionaries (beginning about 1890, especially Muset and Robaut) generally also had, at most, one acute (or grave) accent per word; Lonneux, somewhat later, did likewise in his manuscript dictionaries, but in his manuscript grammar, and printed catechism and liturgy, he had no accents. The American Jesuit Francis Barnum (grammar 1901) followed the Anglo-American tradition, one acute accent at most, per word, after the (generally last) stressed syllable, using ˘ and ¯ for perceived vowel qualities as for English. The Moravian Augustus Schultze (printed grammar 1894) used one acute accent per word, but his successors in Alaska, Ferdinand Drebert and especially John Hinz used essentially a (partial) Kleinschmidt-Greenlandic system, V́C for VC·, V̂ for V·, e.g. *túnâ* [tún·a·] 'gives it' (Drebert's manuscript dictionary has instead ¯ for ˆ, e.g. *túnā*). Their religious materials printed in 1915 show these accents, but those printed 1927-1945 do not. The 1956 New Testament has some ˘, fewer ´. As in the case of Aleut and Koniag, most or all of these writers also used double consonants, with varying frequency, but these correspond by no means consistently to actual geminates. Such were the orthographic practices for the representation of Central Yupik prosody during the period 1850-1950.

The explicit statements we have from these earlier students of Yupik constitute a much more revealing record of their efforts with the prosody than do their orthographical practices, however. The earliest such statement may have been by Nelson (probably writing in the 1880s, not published until 1899:25). It is an interesting one:

> The greatest distinctions in language appeared to be in the curious modification of the sounds of vowels, these being lengthened or shortened in a different manner, thus causing the pronunciation to be differently intoned in the two districts. [i.e., "Unalit" vs. "south of the Yukon mouth"; Nelson is no doubt reacting to the difference between Norton Sound and General Central Yupik, to be explained below].

The Moravian Schultze notes prosodic contrasts (1894:8) in the expected tradition:

> The *accent* generally falls upon the syllable preceding the inflection or the ending of a word, that is in words of two syllables on the first, in words of more than two syllables on the second last or third last. In a few cases the accent determines the meaning of the word, e.g. ag-gi'tok 'worthy', ag'gi-tok 'cheap' [orthographically *akituuq, akiituq*, phonetically [akí·tu·q] : [ák·í·tuq]].

The Jesuit Francis Barnum claims prosodic contrasts in his grammar (1901:8):

> The Innuit [Jesuit usage for all Eskimo, including here, specifically, Central Yupik] language presents a number of words which at first appear to sound alike, but on closer examination these will be found to differ sufficiently either in accent or quantity to preclude any ambiguity.

Barnum follows this with a list of examples, some of which are valid, e.g. *ă̄nākā* 'my mother', *ānā́kā* 'fæces meæ' (orthographically *aanaka* : *anaqa*, phonetically [á·naka] : [aná·qa]), *nŭ̄kā* 'my house', *nūkā́* 'it is his house' (orthographically *nek'a* : *nekaa*, phonetically [nɨ̄k·a] : [nɨ́k·a·]). It was to be a long while yet before vowel length and other Central Yupik prosodic features were to be sorted out.

Aloysius Robaut, a Jesuit who spent many years (1887-1930) with Central Yupik, wrote somewhat later (1916:3), with touching appreciation of the problem:

> In Innuit [Central Yupik] there does not seem to exist any definite rule at all about the accent. It looks very much to be as capricious as the English; and so we leave this gigantic investigation to other brains. In practice only the grave accent (`) will be made use of. Only in some very long words may be aloud [allowed] to take a secondary accent, in which case, the acute (´) is to be used.

Robaut is at least noting that accent is a matter of some (in fact "gigantic") importance for Yupik, and that if a word is long enough, it may have more than one accent. A little later again (ca. 1920:2), Robaut gropes a bit further:

> The accent is generally on the penult; in compound [further suffixed] words it is often thrown back on the antepenult, f.i.: [false statement and false example]. Sometimes, it is the accent alone which can determine the meaning: f.i. akkítok 'costly', ákkitok 'cheap'.

The later Central Yupik work of the major Moravian Yupik scholars, Ferdinand Drebert and John Hinz, shows an increasing understanding of Yupik prosody in the diacritics they used in their lexical and grammatical work of the 1920s and 1930s. Yupik linguistics was now for the first time showing the influence of the Moravian Eskimo linguistic traditions of Labrador and Greenland, including of course Kleinschmidt (1851), but no doubt also Thalbitzer (1904:119-145, 1911:981-983), far less insightful. The most elaborate statement on prosody is in Hinz's grammar (1944:4-5):

> The following diacritical marks are used over vowels: (´) stands over a short and stressed vowel after which the following consonants sounds almost double; e.g. mána (= manna) 'this' . . . (ˆ) stands over a long vowel . . . Examples: mâne (= maane) 'here'[4] . . . Two or more long vowels may follow each other in a word; e.g. ilûmûgok 'is true' [orthographically *ilumuuguq*, phonetically [ilú·mú·ɣuq]; here Hinz fails, however, to distinguish long from lengthened vowels and stress from underlying vowel length].

Hinz continues:

> In many words consisting of three syllables, the accent is placed on the second syllable, and many words of four syllables have the accent on the third. In long words the chief accent is placed on one of the four last syllables, often on the penultima. Examples: ator´tok 'is used; sings', ato´râ 'uses it' [i.e. orthographically *aturtuq*, *aturaa*, phonetically [atúχtuq], [atú·ɣa·]].

With his stress mark written at the end of the syllable here (not to be confused with the acute accent he writes over a vowel with following geminate), Hinz in this case, confronted with the obvious "morphophonetic" alternation in vowel length (if I may use such a term), does clearly manage to separate stress from underlying vowel length. He is also at least recognizing as basic both vowel length and consonant length and, like Robaut, is trying to find a way to predict stress, perhaps implying that longer words may have more than one. Unfortunately, under the influence of Kleinschmidt (and Thalbitzer), and the classical tradition, they are still counting syllables from the end of the word rather than from the beginning. In any case, these missionaries with years of experience in Central Yupik and exposure to the complex phonological surface alternations that result from the interplay of prosodic features clearly now correctly sensed that there ought to be a way to understand them in terms of underlying (vowel and consonant) length and predictable stress.

However, the next and largest steps to this understanding were to be taken by Morris Swadesh. Swadesh worked for some hours with a speaker of Norton Sound Central Yupik at a Sportsmen's Show in New Haven in 1936, and in 1951-52 published his Yupik material in the larger context of his insights into comparative Eskimo. Swadesh comes much closer to predicting stress with the following statement (1952:26):

> Accent is nondistinctive. Some mechanical differences of accentuation are conditioned by the phonetic structure of the syllables and their position in the word. Closed syllables are generally pronounced with more emphasis than open, those with two vowels stronger than single-vowel syllables. The second last syllable tends to receive the chief word accent unless it is a single-vowel open syllable preceded by a stronger syllable.

Swadesh's main advance here is in noting, as did Kleinschmidt (1851:7-8), the importance of syllable structure (weight of closed syllable or long vowel), but his advance in the recognition of positional factors, still counting from the end of the word instead of the beginning, is minor (valid for trisyllables in Norton Sound: CVCV́CV, CV́CCVCV; an only very roundabout recognition of initial closed syllable stress). In that article, Swadesh (1952:33) also explains (at least the synchronic) basis of Alaskan Yupik consonant gemination as resulting from following vowel cluster, as "*kummauq* 'burns' from *kuma-uq*," even where such a cluster is not present at the surface, e.g. "*mikkuq* 'is small' from *miki-*

[4] I.e. orthographically *man'a*, *maani*, phonetically [man·a, má·ni], cognate with a minimal pair example cited in Thalbitzer 1904:124 and 1911:982.

uq."[4] Swadesh then also explains secondary vowel lengthening in open stressed syllables (1952:34):

> In the possessive paradigm of bi-syllabic nouns and some other formations, doubling of the vowel in the second syllable takes place under certain rhythmic circumstances. For example, . . . *acak* 'aunt', *acaaka* 'my aunt'. The condition is that the formation be tri-syllabic or longer and that the first two syllables be morphologically open. The consonant before the doubled vowel is not geminated, in contradistinction to the treatment before a vowel group resulting from contraction.

Thus Swadesh would be able to explain correctly [qayá·qa] 'my kayak', [qáy·á·] 'his kayak', from *qayaq*, as *qayaqa*, *qayaa*, and also [áŋyaqa] 'my boat' (not *[aŋyá·qa]) and [qayánka] 'my kayaks' (not *[qayá·nka]). Swadesh's insights here were perhaps facilitated by the fact that he was working with a prosodic system that was somewhat simpler than that of the rest of Central Yupik, and much simpler than that of Pacific Yupik. The major point he missed, again evidently under the influence of Kleinschmidt and the classical tradition, was the rhythmic stress rule on alternate syllables, and that that works rightward, not leftward. This point was not to be widely understood for another decade or so.

1.3. Alaskan Yupik and Scandinavian scholarship

At this period, the early 1950s, the main work in Alaskan Eskimo and Aleut linguistics was by Scandinavian linguists and humanists, Kaj Birket-Smith, Louis L. Hammerich, and Knut Bergsland.

The Danish ethnographer Kaj Birket-Smith published in 1953 a Chugach vocabulary he had collected in 1933, with the following comment on prosody (1953:236), a radical departure from the Russian tradition:

> As in other Eskimo dialects, the quantity is of essential importance, whereas the dynamic accent [Thalbitzer's term] plays a minor part and is often but slightly differentiated, although there is a tendency to stress long vowels, vowels before a long consonant, and the final syllable.

Birket-Smith is here reacting perhaps both to his expectations from other forms of Eskimo and to the complexity he encountered in Pacific Yupik, including very probably the phenomenon now called "compression," whereby length in closed syllables is converted to stress, and fortition of the syllable-initial (as in the phonetics of one of the current names for the language, *Alutiiq* almost ironically [alú·Tíq], with secondary lengthening of *u* but compression of *ii*, and fortis, fully voiceless *t*).

The Danish humanist Louis L. Hammerich did fieldwork in various dialects of Pacific and Central Yupik in 1951-53 and commented on prosody in an article on Russian loans in Yupik (1954:414):

> Eskimo has no phonemic accent: long syllables have more stress than short syllables. Since quantity is of no great importance in Russian, nothing impedes the Eskimo from retaining Russian phonemic accent in loan words, but he will have a natural tendency to make the Russian stressed syllable long, generally by lengthening the vowel if no consonant cluster. . . prevents it. Deviations have special reasons (e.g. the difference of long and short seems to be less in the dialect of Perryville than in other dialects; this may be the reason why I have noted rather few long vowels in the loanwords of Perryville).

[4] No longer the favored interpretation of such forms, however; see Jacobson, this volume, p. 31; Leer, p. 144; Kaplan, p. 209.

In his remarks on Perryville, and on the apparent failure of Russian stressed vowels to become long in closed Yupik syllables, Hammerich is very probably reacting to Pacific Yupik compression. Hammerich's most extensive Yupik fieldwork (1950), however, was on the Nunivak dialect of Central Yupik, which he transcribed with vowel and consonant length and some primary and secondary accent marks. In his first article on Nunivak dialect (1953:110-111), Hammerich already makes the point that stress is non-phonemic in Eskimo, but is "attracted by quantity" (cf. Kleinschmidt 1851:8, "die schwereren sylben den ton an sich ziehen"), and that sometimes "quantity—which is originally phonemic in Eskimo—becomes indistinct. The result may sometimes be that stress becomes phonemic." In a broad-ranging 1969 lecture (1970:11), Hammerich similarly notes that the Eskimo word

> is further phonemically characterized by accents, no[t] tonal accent, however, nor, fundamentally, stress accent, but the accent of quantity, the difference of short and long phonemes, of short and long syllables. On the other hand, stress follows quantity [i.e., long or closed syllables get stress], and thus, a real stress accent may crop up, if somehow, secondarily, the difference of quantity disappears.

These statements (though not the examples he cites) are certainly appropriate to compression, which, it turns out significantly, is also present in Nunivak (as in Pacific Yupik, demonstrated by Jacobson and Leer in their articles in this volume).

Note also a significant statement by Gordon Marsh (later Priestmonk Innocent), from a very minor contact with Pacific Yupik, in a letter to Frederic Milan, 1952. Marsh had done extensive fieldwork in Aleut, and had written on comparative Eskimo-Aleut with Swadesh. Marsh writes, after about one hour with Koniag at Chignik:

> Another important thing to record is the long vowels, which have been largely ignored in most records of Aleut and Eskimo. For example, I'm pretty sure that the word for 'fresh water' has a long vowel *taaŋaq* like Aleut *taaŋax̂*. It would also pay to mark the position of the accent, as you have done. No one ever bothers to tell what the accent system is for Eskimo, and I don't know where the accent falls or whether it has a clearly fixed pattern as in Aleut . . . However, this [Eastern Aleut penultimate mora stress] pattern doesn't work out in Konyag because possessive suffixes add another syllable without drawing the accent on one more syllable . . .

Astute as these observations on Alaskan Yupik are (e.g. Veniaminov, Nelson, Robaut, Hinz, Birket-Smith, Hammerich, Marsh), we are only able to understand what they are driving at, or rather reacting to, in the light of research during the past twenty years. Even with the better, more extensive, and more meticulous of the pre-1960 transcriptions, it would be a philological feat indeed to make and successfully test hypotheses that satisfactorily explain the complexities of Alaskan Yupik prosodic systems, if we did not also have the more recent data. The strongest light so far in the picture is Swadesh, who had both the best linguistic preparation and the simplest of the Alaskan systems to work with.

Knut Bergsland has concentrated his work on Aleut, Inupiaq, and comparative Eskimo-Aleut, not Yupik. He has, however, made important comments on Yupik prosody, especially in the historical perspective of comparative Eskimo(-Aleut). Already in his first comparative Eskimo-Aleut publication (1951:179) Bergsland remarks that "consonant quantity is phonemic in E[skimo] but does not seem to be so in A[leut]. . . . Stress seems to be non-phonemic in both languages." In his grammar of Greenlandic Bergsland (1955:9-13) explains the origin of geminates there in a certain type of syncopation (contraction), and he notes in 1956 (1958:626) that the "Eastern type of gemination, for example *amiq* 'skin', relative *ammip* (Gr., [<*ami(rə)m]) apparently has been lost in Western Eskimo, for example in the relative form *amim*, and possibly also in Aleut (? cf. W[estern] A[leut]

amu- 'dress'), having in both languages yielded to a new prosodic pattern." In his article on the Eskimo-Uralic hypothesis (1959:8-10), Bergsland further discusses the early gemination and proto-Eskimo (-Aleut) prosody, including the critical point that "the present long vowels and diphthongs very obviously are due to the later disappearance of a continuant (mostly spirant) separating the two short vowels," implying a stage in which these languages lacked VV sequences. (Note that Bergsland here is writing before we had the strong evidence to refer to in Sirenikski which points to just such a state.) Bergsland continues, "In Western Eskimo and Aleut there are long vowels due to certain other secondary developments but in Proto-Eskimo (Eskimo-Aleut) there seem to have been just the [single, short] vowels a, i, u, and the reduced ə." Somewhat later (1967:211-212), Bergsland makes some brief comments on the history of modern Yupik prosody specifically. He explains the CY gemination in Hammerich's Nunivak *an·iu* 'snow', Swadesh's *anniu* (cf. CSY [aní·ɣu]), as due to "loss of the velar spirant and lengthening of the consonant before the secondary diphthong," and that "the lengthening of the medial vowel in trisyllabic forms [such as CSY [aní·ɣu], CY [avá·ni] 'there far away'] could hardly be dated to Proto-Yupik, being apparently also later than the abbreviation of the [earlier Eskimo] geminates. On the Alaskan side, it could rather be connected with the high pitch on the same syllable in Aleut, as on the second *a* in *haqakur* 'he comes'." At the same time, Bergsland states that "the prosodic structure of the various western dialects [Yupik] remains to be clarified," by 1967 a most timely remark, to be sure.

1.4. Central Siberian Yupik

Simpler than any of the Alaskan systems is that of the Chaplinski and St. Lawrence Island varieties of Siberian Yupik, which together have here been called the Central Siberian Yupik language (CSY). (Naukanski and Sirenikski, as noted, deserve the status of separate languages, and will be dealt with mainly in a separate paper in this volume.) The earliest known Siberian Yupik wordlists are from 1791, by Robek (Naukanski) and Merk (Chaplinski). These, however (at least those so far published), are without accent marks (though such may have been present in the manuscript). The few subsequent major published Siberian Yupik wordlists are also without accents, until the work of Gondatti in 1895 (edited and published by Miller, 1897a, 1897b; all three languages, with accent marks). This was followed shortly by Bogoraz in 1901. Bogoraz's considerable writing on Asiatic Eskimo includes macron (very sparingly) for "unusual length," and acute accent (at most one per word) generally on the last stressed syllable (therefore the penult or antepenult), but there is no statement that I have noted concerning stress or prosody, and no particular understanding of it demonstrated in his use of accent marks. In the booklet of Bible quotations (1910) for St. Lawrence Island by E. O. Campbell, medical missionary at Gambell, there is also accent, one per word, in the Anglo-American orthoepic tradition, but there was no further documentation of the language of St. Lawrence Island for another fifty years. The Soviet school literature in Chaplinski, which meanwhile began in 1932, has never recognized in writing either accent or vowel length.*

CSY has no consecutive unlike vowels, all such underlying sequences being assimilated to *ii* or *aa* (*ai, ia, ui, iu* → *ii; ua, au* → *aa*), so that the syllable nuclei of the language consist only of long and short vowels: *i, a, u* (and of ə, always short). This development, which introduces significant morphophonemic alternation and abstractness, sharply differentiates CSY from Alaskan Yupik. Soviet linguists were perhaps not prone to write double vowels for long vowels because in Russian such sequences imply disyllabicity, clearly repeated pulses (not the case in Yupik), and since there was no need to write two vowels for diphthongs, there was no further motivation to do so for long vowels. Another reason, of course, was that they had not analyzed the prosody they were faced with to do this adequately. However, Soviet linguists working on Eskimo, mainly now (1938 to 1960s)

* Except for a very few desultory double vowels in 1946-48. In 1947 Menovshchikov may have done some laboratory work on Chaplinski phonetics with Zinder, which perhaps included some attention to prosody. This would have been the first such in Soviet times and was perhaps the stimulus for those occasional double vowels. See Menovshchikov 1959:305, Menovshchikov 1956 ms. (not seen), and Rubtsova 1954:16, quoted in this paper.

G. A. Menovshchikov and E. S. Rubtsova, were certainly aware that there was significant vowel length and stress. Of these two Soviet linguists, Rubtsova was evidently much the more concerned with this problem. She is to be credited with recognizing, in the 1940s, the alternate syllable stress principle, counting from left to right. In the introduction to her remarkable volume of Chaplino texts (1954:16, finished 1950), Rubtsova makes a most insightful and useful statement on Yupik prosody:

> The rules for use of long and short vowels have not yet been discovered; therefore the possibility is not excluded that in some cases our transcriptions may prove to be not fully accurate.
>
> Moreover, everywhere [in this volume] we mark stress, which also is not [done] in the orthography for the literature.
>
> It should be noted that stress in the literary language [Chaplinski], beginning with the second syllable, regularly recurs on every other syllable. This harmony is disturbed only by long or short vowels. Long vowels sometimes dislocate the stress. Short vowels sometimes drop or are pronounced very short, thereby also disturbing the regular alternation of stress. In the Sirenikski dialect, in which it was not possible to distinguish long vowels, stress in all cases regularly recurs on every other syllable.

In her volume of texts (transcribed 1941, published 1954), and in her manuscript notations on her personal copy of her Russian-Eskimo dictionary (published 1941), Rubtsova wrote both stress (acute; multiple stresses per word, where appropriate) and length (macron) with some degree of accuracy. In her article on adverbs (1966; here V: was substituted for V̄), and especially in her last published work, the Eskimo-Russian dictionary (1971), which appeared six months before her death in her eighty-fourth year, her length and stress marks continued to advance in consistency and accuracy.

Menovshchikov, in the introduction to his Eskimo-Russian school dictionary (1954:4, the same year as Rubtsova's texts), makes his earliest published statement recognizing distinctive vowel length or stress:

> Words, which (being different in meaning) by the rules of orthography are written alike, but are pronounced differently,—are not homonyms and therefore are not marked with [roman] numerals, for example: [citing *pamá* 'up there', *pāma* 'pump', *pāmá* 'flame']. Vowel length (not marked in ordinary writing), and also stress—are represented in the dictionary in those cases when they help to distinguish words which are not the same in meaning.

In the body of the dictionary itself, though the Russian glosses have accents throughout, the only accents on the Eskimo are the acute in the three entries cited above: *pamá*, *pāma*, and *pamá* [viz. *pama*, *paama* (from English), and *pamaa* 'it flickers' (impersonal transitive)]. Otherwise, the homographs are entered as homonyms (i.e. homophones), with roman numerals, e.g. *ama* I 'wolf', *ama* II 'over there', *ama* III 'also' [viz. *amaa*, *ama*, *ama*]; *mani* I 'here', *mani* II 'money' [viz. *maani*, *mani* (from English)]; *na* I 'place', *na* II 'mother' [viz. *na*, *naa*]; *sama* I 'also', *sama* II 'down there' [viz. *saama*, *sama*]. The only further statements Menovshchikov has published on Chaplinski prosody, to my knowledge, are in his pedagogical grammar (1960:49-53), his detailed academic grammar (Part I, 1962:45-48), and grammatical sketch (1968:368). He recognizes what he calls, after Thalbitzer, "dynamic stress" (´) and "quantitative stress" (¯), which may sometimes occur on the same syllable (ˊ). He attempts to classify patterns in words of two syllables (highly variable), three, four, five, and six or more syllables, and notes (1960:52, 1962:47, fn. [explicitly from Rubtsova 1954], and 1968:368) that there is a tendency for stress to fall on alternate syllables. He sees, however, that this pattern is often disrupted, to produce a bewildering multiplicity of sequences of variously stressed syllables. In both his terminology and approach, and also his bewilderment, one can see the influence

of Thalbitzer (1904:124-129 especially). Menovshchikov recognizes that there are prosodically distinguished minimal pairs, providing a list of examples (1960:70-71 "homophones," 1962:48), and that the problem of Eskimo prosody "remains poorly worked out." He is aware that there are (at least) two types of prosodic features at play here, but acknowledges that further work is necessary to distinguish them; his transcriptions that include prosodic marks do not approach observational adequacy to the extent that Rubtsova's do. (Generally, in his grammatical and academic articles, Menovshchikov's transcriptions are as in the orthography, without marks for length or accent.)[7]

N.M. Emel'yanova, who began her fieldwork in the 1960s, has collected large amounts of lexicon in all varieties of Asiatic Eskimo, the transcription of which includes marks for length and stress, as does her most recent major publication on Chaplinski verb classes (1982).

In any case, it was for Central Siberian Yupik that the first essentially adequate written statement of Yupik prosody was to be made. This was by David Shinen of the Summer Institute of Linguistics, working at Gambell, St. Lawrence Island, independently of both the Soviet research and of ours on Central Yupik at Fairbanks. Soon after his arrival on St. Lawrence Island, Shinen wrote (1961:14) that "the investigation of the suprasegmental features, stress, length, and pitch, is incomplete. At present there are indications that stress and length will prove to be significant features in the language." He was, of course, quite correct, and during the next seven years made very significant strides in figuring it out. In a brief paper (1968:4-5) entitled "Some Notes on the Sound System of St. Lawrence Island Yupik," Shinen notes that /a i u/ can be pronounced with contrasting single or double length, and that "vowel length can affect meaning and accent (or stress)." Concerning stress, he states that it

> follows these general rules: 1. Two syllable words: the first syllable is stressed [not necessarily correct].[8] 2. Three syllable words: the second syllable is stressed. 3. Four or more syllables: the second, fourth, sixth, etc. syllable receives stress [e.g.] ... iɣam'siqa'naxaliq 'thank you'. 4. Syllables with long vowels always receive stress regardless of the above three rules. Every second, fourth, etc. syllable following a syllable with a long vowel receives stress: [e.g.]...mama'lii'ɣatu'ŋa 'I do not use milk'. [Transcriptions here normalized].

Shinen here has understood not only the alternate syllable stress rule, counting from the left (and from every long vowel), he has also understood the difference, first noted by Swadesh for CAY, between an underlying long vowel and a vowel lengthened in an open syllable by stress, thus combining these two insights to arrive at an essentially adequate understanding of this (simplest) Yupik prosodic system. Shinen has not explicitly recognized in this statement the distinction between underlyingly long vowel and one lengthened in a stressed open syllable, but he apparently does so implicitly in

[7] Two recent statements on prosody in new publications by Menovshchikov came to my attention just as the above was going to press. In the introduction to a new Eskimo-Russian (and Russian-Eskimo) school dictionary (1983:[9]) Menovshchikov notes: "Stress or length in Eskimo words is given only in those cases where they have a semantically differentiating significance: *ama* I 'wolf', *amâ* II 'over there', *amā* III 'also'" (viz. *amau, ama, amai*). In the body of the dictionary, however, the only homographs so differentiated are those just mentioned, and *pama* 'pump', *pamâ* 'up there' (*mani, na, sama* as in 1954), while on the other hand in about half a dozen entries there is a macron correctly used, e.g. *kik* 'summer', *kāŋu* 'goose sp.' (*kiik, kaangu*).

In a new revised edition of Menovshchikov's 1960 pedagogical grammar, there is another statement concerning vowel length and stress. This is essentially an abridgment of his 1960:49-53 statement (Menovshchikov and Vakhtin 1983:41-42), basically unchanged, distinguishing dynamic (´) and quantitative (¯) stress, noting that the former tends to occur in closed syllables and the latter in open, but that there are many exceptions, and that in polysyllables stress tends to fall on alternate syllables. The section on lexicon includes (1983:53) a list of homographs differentiated here by accent or length, some correctly or partly so (as in 1960:70-71).

[8] Since in CSY final syllables either do not receive stress, or, alternatively, stress is always deleted on final syllables, and since stress does not fall on initial syllables unless long, it follows that CSY disyllables have no stress unless the first syllable is long. For further discussion of this and other supplementary points of CSY prosody, see the separate paper in this volume.

his transcription of [mamá·lí·ɣatú·ŋa], where he writes [-má·-] as (underlyingly) short though lengthened (in open syllable stressed by alternate syllable stress rule, here his rule 3), [-lí·-] therefore underlyingly long (because, following a stressed syllable, stressed and long only because underlyingly long), and [-tú·-] (underly[illegible]gly) short though lengthened (in open syllable stressed by alternate syllable stress rule, here his rul[illegible]). Shinen further recognizes the difference between a lengthened short (phonetically long) and len[illegible]ned long (phonetically overlong) vowel in open stressed syllable, with his examples *ix̣saquq* 'heart' and *ix̣saaquq* 'he refuses' ([-sá·-] and [-sâ:-]).

2. Recent progress, 1967-1984

2.1. Miyaoka and the University of Alaska group

During the 1960s linguistic work on Yupik, especially Central Yupik, intensified with the development of the Alaska Native language research and teaching program at the University of Alaska, Fairbanks. By the late 1960s this work intensified still further with the arrival of Osahito Miyaoka, who joined Irene Reed and myself in the program here. The need for the establishment of a definitive and unified practical orthography for Central Yupik was becoming quite pressing as the basis for use of the language in the schools, as the possibility of bilingual education in Yupik began to approach (considering e.g. the federal bilingual education bill of 1967). By that time the major phonological problems still unsolved, both from an academic point of view and for the purpose of the practical orthography, certainly centered on the prosody. The timeliness of Bergsland's remark (1967: "The prosodic structure of the various western dialects remains to be clarified") was indeed uncanny.

Miyaoka brought to Fairbanks some years of independent consideration of comparative Eskimo phonology and Swadesh's insights into Central Yupik prosody. After his first stay in Alaska and lively further discussion with us, Miyaoka published two important papers on Central Yupik prosody (1970, 1971). These papers deal extensively with the phenomenon of consonant gemination before two vowels and that and other complications in connection with the fourth vowel (i), but perhaps their main contribution consists in their explanation of vowel lengthening as taking place on the second of two short open syllables, the first formulation for Central Yupik of the prosodic modification as affecting alternate syllables, in a rightward direction, and not affecting the word-final syllable. Miyaoka viewed the phenomenon as vowel lengthening, however, not as stress, so that it affected open syllables only, and the alternation of lengthened and non-lengthened syllables he described in terms of what he called "disyllabic metrical feet" (¯˘), thus *qāyāpīkāqa* [qaya·pika·qa] 'it is my authentic kayak', but *āŋyāpīkāqa* [aŋyapi·kaqa] 'it is my authentic boat'. Since Miyaoka's lengthening is predicted on the second of two open short-vowel syllables, it also explains the non-lengthening of e.g. *-pa-* in [aŋyaχpaka] 'my big boat'. In order to explain another pronunciation of that form, [aŋyaχpa·ka], Miyaoka correctly suspects dialect mixture, citing the inconsistency in two forms [atuɣnaqɬuni] 'it can be used' and [atuɣlaχtu·kut] 'we usually use', both from Martha Teeluk. Mrs. Teeluk, it later became clear, does indeed have dialect mixture, of what we now call General Central Yupik, in which no sequence CVCCV́CV (stressed or lengthened open syllable following closed syllable) is permitted (without boundary), and Norton Sound or Unaliq, which does permit such sequences (except where the closed syllable is word-initial). Thus [aŋyaχpaka] and [atuɣnaqɬuni] are General Central Yupik, while [aŋyaχpa·ka] and [atuɣlaχtu·kut] are Norton Sound. During 1968 Miyaoka was able to do some broader fieldwork, including brief sessions with speakers of Pacific Yupik, Siberian Yupik, and Nunivak. He was able to observe that his basic principle of primary lengthening of the second of two open syllables held generally for "Western Eskimo," but that there was variation in the operation of certain rules. He recognized the need for broader investigation in the different Yupik languages and dialects. At this stage, however, it was at least possible for us to settle on an orthography that recognized underlying vowel length (as opposed to lengthened vowels), even though we could not fully predict who would lengthen which vowels when. The state of our knowledge at that point was summed up by Miyaoka in an early version (1971b) of the phonological

portion of his Central Yupik grammatical sketch (forthcoming).

In 1971 I investigated St. Lawrence Island Yupik, essentially confirmed (partly rediscovered) what Shinen had stated, and added some refinements, to write up a rather full description of the surface phonology and some of the morphophonemics of CSY (first paper presented 1971, main publication 1975, written 1973).[9] This simplest Yupik prosody was formulated in terms of stress assignment (on all long [double] vowels; then on every second syllable after a long vowel or after the beginning of a word [i.e. on every syllable following an unstressed syllable]; but all final syllables lose stress or never receive it). In CSY stress assignment is not affected by whether any syllables are open or closed, not even the word-initial syllable. However, if a syllable is stressed and open, the vowel is lengthened, the lengthening thus being predictable in terms of stress assignment and syllable structure. Moreover, in open syllables with double vowel in stressed position (i.e., following unstressed syllable), the double vowel becomes overlengthened, thus distinguished from a single vowel in that position by further lengthening of the vowel (and by falling tone), whereas in Alaskan Yupik, the initial consonant of that syllable is geminated (if intervocalic) instead of the vowel being further lengthened: thus, while *qayani* 'his own kayak' is [qayá·ni] in both CSY and Alaskan Yupik, *qayaani* 'in his own kayak' is [qayâ:ni] in CSY and [qáy·á·ni] in Alaskan. The other and major fundamental difference in the prosody of sequences of syllables without double vowels was in the different degrees to which the different forms of Yupik avoid the sequence of such a syllable, open and stressed, following a closed one. CSY does not avoid such sequences at all, Norton Sound CAY does not have them at the beginning of a word, and the rest of Alaskan Yupik avoids all such sequences: thus *angyani* 'his own boat', CSY [aŋyá·ni], but all Alaskan [áŋyani]; further, *aŋyaxpaka* 'my big boat', CSY [aŋyáxpaka], Norton Sound [áŋyaxpá·ka], other Alaskan [áŋyáxpaka].

During the period 1971-1976, Reed, Miyaoka, Afcan, Krauss, and now especially also Steven Jacobson and Jeff Leer, continued intensive research on Yupik phonology. The first major publication was the pedagogical *Yup'ik Eskimo Grammar* (1977, drafts circulated 1971, 1975). Chapters I (pp. 1-17) and II (pp. 18-38) contain a rather full and systematic basic statement of the phonetics and phonology (morphophonemics) of the language.[10] Since the presentation of the prosody in Chapter I is written primarily with pedagogical purposes in mind, in the form of instructions on how to pronounce the orthographical forms,[11] particularly which vowels to lengthen by what is there called "rhythmic lengthening," and then which syllables to stress, we also added an appendix (pp. 312-313) in which we presented the rules for vowel lengthening and consonant lengthening (gemination) as following the rules for stress assignment: (1) inherent stress–on VV and closed initial syllable; and (2) rhythmic stress–on (non-final) syllables following an unstressed syllable, except that if the unstressed syllable is closed, the following open syllable does not receive rhythmic stress, but instead, as we then phrased it, the stress "skips" to the following syllable. We had by then understood, as we added in a footnote, that in the "Kotlik" (i.e. Norton Sound) area, this exception to the placement of rhythmic stress did not apply, thus finally explaining the difference in the realizations of *paqnaksaqunaku* 'don't be inquisitive about it' (GCY) [páqŋaksaqú·naku] and (Norton Sound) [páqŋaksá·quná·ku]. (Later we would describe the former as [páqnáksaqú·naku], with stress "retracting" to the closed syllable *-nak-* preceding the *-sa-*, with regular alternate syllable rhythmic stress and lengthening on *-qu-*, rather than "skipping" of stress to *-qu-*.)

[9] This paper, which goes into some detail about the phonetics of CSY vowel length and overlength (1975:55-57) has been followed by pedagogical literature: Shinen (1976:49-56) and especially Kaneshiro and Krauss (1981). The latter is entirely devoted to providing explanations and practice in recognizing vowel length correctly in all syllable types, and in understanding the effects of stress, for the student to learn to read and spell correctly.

[10] Note review by Menovshchikov and Vakhtin which acknowledges the comprehensiveness and significance of this treatment (1979:147).

[11] The same basic approach is taken in Miyaoka and Mather's pedagogical work on the subject (1978:17-21, 39-62, 134-140; 1979:15-23, 40-63, 138-144), designed to teach the Yupik-speaking student to understand the prosodic system for the purpose of reading and writing the orthography correctly, and only secondarily to understand the effects of stress.

Since 1976 many more of the details and dialectology of Central Alaskan Yupik prosody have been worked out. The perturbation caused by *ra*-deletion had been noted and understood already in 1973 by Miyaoka (1974; Reed et al. 1977:15, 37-38). Jacobson included a comparison of CAY and CSY prosody in his sketch of St. Lawrence Island grammar (1977); he investigated at length and reported on the special characteristics of the Hooper Bay-Chevak (1979a), Nunivak (1979b), and Norton Sound (1980) dialects. Anthony Woodbury provided more information at Chevak for the Hooper Bay-Chevak dialect (1981a, for the prosody especially pp. 42-49, and pp. 85-92, the latter more synthetic, covering also *-rar*-simplification and other topics), thus extending good coverage to all the divergent dialects of Central Yupik. A description of the phonological differences in these is included in Jacobson's introduction to his Central Yupik dictionary (1984a:28-37). Miyaoka, who summarized his earlier views on Central Yupik prosody in a general introduction to the field of Eskimo linguistics (published in Japanese, 1978:95-113), has continued to develop his own unified interpretation of Central Yupik prosody in his grammatical sketch of the language (forthcoming, main draft 1975, revised 1983), in pedagogical works on orthography (Miyaoka and Mather 1978, 1979, noted above; also Miyaoka and Mather 1984:36-41, for an especially fine basic presentation); and above all now in his paper in this volume. Also to be included in the growing literature on Central Yupik prosody are a note by Jacobson (1981) on the semantically "empty" bases *pi-* and *ca-*, which he shows to be phonologically anomalous also in remaining unstressed even when in closed syllables; a note by Miyaoka (1982) responding to Jacobson (1980) on Norton Sound subdialectology; and papers by Woodbury on stridentization of voiced continuants (1979, especially *w*~*v*, *l*, *y*~*z*), a prosody-related problem, and on symbolic processes (e.g. in vocative, interrogative, nicknames, other affective forms, and also discourse phenomena), which Woodbury shows (1981b, 1983, 1984a, and especially 1984b) to be quite productive in the prosody; an article by Jacobson (1984b) elaborating on Jacobson (1981) and on initial syllable stress and stem stress in both CAY and CSY. Woodbury (1983:1-9, 1984b:12-24) also includes a very useful metrically-based summary of CAY word-level prosody.

2.2. Work by Leer

In 1972 Jeff Leer began his extensive and intensive research on Pacific Yupik (Alutiiq), which has by far the most intricately developed of all Yupik prosodies, both in terms of the phonetics (stress, length, gemination, late deletion of certain voiced fricatives to produce another level of vowel sequences, conversion of length in closed syllables to compression, fortisness of consonants), and in stress assignment itself, now partly morphological, i.e., with fixed stresses in certain suffixes, interacting differently in the dialects with the phonologically regular stress assignments. Leer wrote preliminary descriptions of Pacific Yupik phonology in unpublished papers (1972a, 1973, 1974a) and a fuller description of it for the Kenai Peninsula dialect (1978), but at the same time formulated his analyses of Pacific Yupik prosody as part of a much more extended comparative view of Yupik prosody in general, including notes on Central Alaskan Yupik (1972b).

In this framework, it was much easier to understand the nature and significance of the "compression" noted also in both the Nunivak and Hooper Bay-Chevak dialects (noted as early as 1973 for Hooper Bay by Leer), as related somehow to that of Pacific Yupik. This connection between those coastal pockets and the more southerly Yupik implied then an interruption by the spread of General Central Yupik, displacing in early historic times some presumably coastal dialect which had compression, perhaps the somewhat mysterious "Aglurmiut," or some such intermediate group once evidently connecting Pacific Yupik and the HBC-Nunivak pocket; this seems to be confirmed lexically also by some of the early wordlists (see Jacobson 1984:627-628).

Leer's work during this period was important not only in extending our understanding into the Pacific Yupik area, and in tying together the whole range of Yupik, but it also extended our understanding into a somewhat unexpected area, namely the Inupiaq of Seward Peninsula, which intervenes in the geographical continuity between Alaskan Yupik and Siberian Yupik. In retrospect, of

course, this should not have been unexpected, but it is to Leer's credit that the consonant weakening, particularly of the Bering Strait Inupiaq dialects, was first properly understood and discovered to be intimately related to Yupik prosody. This consonant weakening had already been noted by Jenness (1927), but not explained. Menovshchikov (1966) and Heinrich before him (1955a,b) could hardly avoid noticing it in the Diomede dialect, so pervasive is it there, but even in his full-scale monograph (1980) on the Diomede dialect, Menovshchikov does not deal with the issue.[12] During a survey of Seward Peninsula Inupiaq dialects in which he clearly defined the main phonological characteristics of Seward Peninsula Inupiaq dialectology (1974b), Leer noted that consonant weakening in the Bering Strait dialect could be predicted in alternate syllables by a rule similar to that for predicting Yupik stress. A classic illustration by now of the process of weakening is the behavior of the postbase 'to have', [-ɣaq- ~ -qa·-], underlying *-qaq-* (though never realized as such in this dialect), with the bases *mannik* 'egg' and *manik* 'money', and with the first person plural indicative ending (underlying) *-tuɣut* for King Island. The form 'we have eggs' (North Slope dialect [man·iqaqtuɣut]) here is realized [man·iɣaqtuut], and the form 'we have money' (North Slope [maniqaqtuɣut]) is here realized [maniqa·tuɣut], with weakenings of *q* (intervocalically to ɣ, preconsonantally to ·) and of ɣ (to zero) in alternate syllables. The consonant following the syllable that would be unstressed in Yupik is the one that is weakened: thus, if these underlying forms were Yupik, they would be realized [mán·iqáq-tuɣut] and [maní·qaqtú·ɣut] respectively. In Bering Strait Inupiaq, in the first word the weakening changes the first *q* (to ɣ) and the ɣ (to zero), whereas in the second the weakening (on King Island) changes the second *q* (to ·) and the ɣ remains unchanged. It is moreover clear that the prosodic rules which underlie these changes are specifically those of the Norton Sound dialect of Central Alaskan Yupik, not of GCY, for in GCY the second form, *maniqaqtugut*, would be accentuated [maní·qáq-tuɣut], with stress retraction from open to preceding closed syllable, to yield the incorrect Inupiaq *[maniqaqtuut]. The underlying system could not be that of Siberian Yupik either, since there a cluster (in this case a geminate) would not attract stress to the initial syllable, as seen in Bering Strait Inupiaq [iɣluɣaqtuut] 'we have a house', which, if CSY, would be accentuated [iɣlú·qaqtú·ɣut] (to produce an incorrect Inupiaq *[iɣluqa·tuɣut]). Leer's work thus not only nicely explained the Inupiaq weakening, but at the same time showed that it was due to the (presumably substratal) influence of the Yupik it replaced, and this Yupik moreover could thus be seen to have had a prosody specifically that of the Norton Sound dialect of Central Alaskan Yupik.

Leer's preliminary version (1977) of his paper appearing in this volume showed Yupik prosody clearly as a kind of continuum of increasing complexity from CSY (which I shall here call stage one: stress placement on long vowels, and on short vowels after unstressed vowels; lengthening of stressed vowels in open syllables), through Norton Sound (and the substratum for the intervening Inupiaq; which I shall here call stage two: as preceding, but stress also on initial closed syllable; gemination of consonant after unstressed vowel before VV instead of overlengthening VV); to GCY (which I shall here call stage three: as preceding, but stress retracting also to any closed syllable from a following short open one); and to the further increasing complexity to the south (stage four and beyond), beginning with the "compression" noted already in HBC and Nunivak as well as Pacific Yupik. All of this is now extensively covered in the papers that follow in this volume.

[12] D.R.F. Collis, in his review (*Etudes/Inuit/Studies* 5:155-156, 1981) of Menovshchikov's Diomede (Imakliksk) monograph, evidently does not see that the consonant weakening is an issue, either.

In this monograph, Menovshchikov includes a treatment of stress (1980:37-38), in which stress and vowel length are treated in the same way as in his Yupik work; however, the author does himself state that his stress and length notations are essentially impressionistic, without exact definition.

SIBERIAN YUPIK AND CENTRAL YUPIK PROSODY

Steven A. Jacobson

1. Introduction

In this paper I examine the rhythmic stress systems and related phenomena of the (Central) Siberian Yupik Eskimo language (here abbreviated SY[1]) and the Central (Alaskan) Yupik Eskimo language (here abbreviated CY). I do not deal with the other varieties of Siberian Yupik, as they are discussed at length by Krauss elsewhere in this volume. The prosody of all dialects of Central Yupik, however, is closely examined here.[2]

There is a natural progression in the discussion of prosody in the various Yupik languages and their dialects (and Seward Peninsula Inupiaq). This progression begins with SY, goes on to the Norton Sound dialect of CY, thence to the rest of CY, and ends with the dialects of Alutiiq. The prosodies of the other divergent forms of Asiatic Eskimo are tangential topics which should be considered in connection with (Central) SY. Similarly, Seward Peninsula Inupiaq prosody is tangential to that of Norton Sound CY. The present paper omits these topics, all of which are covered by Krauss and Kaplan, respectively, in this volume; furthermore, it does not go past CY to Alutiiq, which has by far the most complex prosody of all and is discussed at length by Leer in this volume.

First, I shall introduce certain terms. Inasmuch as Eskimo languages do not (generally) have clusters of three vowels or of three consonants, nor word-initial or word-final clusters of two consonants,[3] syllable types are considered to be CV, CVC, CVV, CVVC[4] (and, word-initially, V, VC, VV, and VVC). A syllable containing one vowel is said to be "light"; a syllable with two vowels is "heavy"; a syllable ending in a vowel is "open"; and a syllable ending in a consonant is "closed."

The vowels *a*, *i*, and *u* are "full" vowels, while *e* (i.e. [ə]) is "reduced."

The "stem" of a word will be understood as the initial morpheme of the word, while the "base" of a word is the conventionalized combining form of that word, i.e., the word stripped of its inflec-

[1] Central Siberian Yupik is also abbreviated CSY to differentiate it from the other two varieties of Siberian Yupik, Naukanski and Sirenikski. However, since I am using CY for Central (Alaskan) Yupik, to avoid confusion, I shall keep SY rather than CSY, cautioning the reader to remember that my SY is only Central Siberian Yupik and not the other two varieties.

[2] Information on SY is from Linda Badten and Vera Kaneshiro of Gambell and others from both Gambell and Savoonga. Information on CY is from Flora Peterson of Golovin; on the NSK dialect of CY from Martha Teeluk, Cathy Moses and others from Kotlik; on the HBC dialect of CY from Monica Smith and Sam Moses, of Chevak, and others from both Hooper Bay and Chevak. Information on the NUN dialect of CY comes from Marjorie McDonald of Mekoryuk. GCY dialect information comes from my wife, Anna Jacobson, of Kwethluk, and many speakers from all areas (over thirty villages) encountered in my Yup'ik classes at the University of Alaska, Fairbanks, and in the course of research for the *Yup'ik Eskimo Dictionary*.

[3] SY does have clusters of three consonants to a very limited extent (Krauss 1975.53). This situation does not affect anything said here about SY prosody.

[4] It is also possible to consider a syllable as containing only one vowel, that is, to base prosody on vowel morae. Such an approach is followed by, for example, Miyaoka and Mather in *Yup'ik Eskimo Orthography*, and by Miyaoka in his article in this volume.

tional suffix.[5] Thus, in the SY and CY word *qayapinguq* 'he got an authentic kayak', the stem is *qayaq* 'kayak' and the base is *qayapinge-* 'to get an authentic kayak'. The elements leading from stem to word are derivational suffixes, here called "postbases"; an inflectional suffix, here the "ending"; and post-ending suffixes, here "enclitics."

SY and CY words used as examples will be written in the standard practical orthographies for those languages and also in phonetic transcription.[6]

2. Central Siberian Yupik (SY)

It should be noted at the outset that SY phonotactics forbid two features found in every other (non-Siberian) Eskimo language; these are gemination and clusters of two unlike vowels. As will be seen, the lack of these features plays a major role in the differences between SY and CY prosody.

2.1. SY stress

Ordered stress and lengthening rules for SY are as follows, with items in brackets not applicable to SY but applicable to CY and listed here for the sake of comparison.

[1. Prosodic *e* deletion]
2. Inherent stress (i.e., stress independent of rhythm)
   [a. Initial closed syllable stress]
   b. Heavy syllables are stressed
   [c. Regressive stress]
3. Rhythmic stress: The syllable following an unstressed syllable is stressed
4. Final syllable de-stressing: a final syllable loses stress
5. Rhythmic lengthening
   a. A full vowel in a stressed open light syllable is lengthened
   b. A vowel in a stressed open heavy syllable following an unstressed syllable is "overlengthened" (explained below) and given a falling intonation (recall that in SY there are no heavy syllables with two unlike vowels)

[6. Automatic gemination]
[7. Secondary stress]

Examples:

aangqaghllaghllangyugtuq [á·ŋqaχɬáχɬaŋyúχtuq] 'he wants to make a big ball'; inherent stress (2b) on *aang-*; rhythmic stress (3) on *-llagh-* and *-yug-*.

angyaghllaghllangyugtuq [aŋyáχɬaχɬáŋyuχtuq] 'he wants to make a big boat'; no inherent stress; rhythmic stress (3) on *-yagh-* and *-llang-* but lost from *-tuq* because final (4).

[5] I follow the system of bases as given by Reed et al. in *Yup'ik Eskimo Grammar* (1977) (including the proposed change described in the addenda, pp. 314-316). Final and "semi-final" (i.e., followed by a consonant) *e*s on bases are a matter of convention, but changing the conventions concerning whether such an *e* is part of the base and sometimes deleted, or is not part of the base but is sometimes inserted, would not significantly alter anything said here about prosody.

[6] The standard orthographies are described in Krauss (1975), "St. Lawrence Island Eskimo phonology and orthography," and Reed et al. (1977), *Yup'ik Eskimo Grammar*. To mention a few of the main points, the writing systems of both languages do not directly represent such prosodic features as stress, rhythmic lengthening, and prosodic gemination; both systems use the device of doubling (voiced) fricative letters to indicate voicelessness (though in SY [s] and [f] are *s*, *f*), but when voicelessness is automatic due to contiguity with other voiceless consonants, doubling is omitted. CY uses the apostrophe to show non-prosodic gemination and for several other purposes (some discussed in this paper). The letter *e* is used for the schwa ([ə], [ɨ]) in both languages; the letter *g* is used for the (front) velar fricative [ɣ] in both languages, while for the (back) velar (or uvular) fricative [ɣ], CY uses *r* and SY uses *gh*.

qayani [qayá·ni] 'his own kayak';
rhythmic stress (3) on *-ya-*, which being open is lengthened (5a).

qayaani [qayá:ni] 'in his (another's) kayak';
inherent stress (2b) on *-yaa-*, which being open is further lengthened ("over-lengthened") so that it is longer than *-ya-* in the preceding example, and *-yaa-* here is given a falling intonation.

saguyaani [saɣú·yá·ni] 'in his (another's) drum';
rhythymic stress (3) on *-gu-;* inherent stress (2b) on *-yaa-* without overlengthening since it follows a stressed syllable; *-gu-* has rhythmic length (5a).

qayapigkani [qayá·pixká·ni] 'his own future authentic kayak';
no inherent stress; rhythmic stress (3) on *-ya-* and *-ka-*, which are therefore lengthened (5a).

qayapigkaani [qayá·pixká:ni] 'in his (another's) future authentic kayak';
inherent stress (2b) on *-kaa-;* rhythmic stress (3) on *-ya-;* both syllables are open so *-ya-* is lengthened (5a), and *-kaa-* overlengthened (5b), making it longer than *-ka-* in the preceding example.

atepik [atə́pik] 'real name';
no inherent stress; rhythmic stress (3) without lengthening of *-te-* since vowel is not full.

angyaghllaka [aŋyáɣ̣ɬaka] 'my big boat';
no inherent stress; rhythmic stress (3) on *-yagh-* and also on *-ka*, which being final loses its stress and therefore is not lengthened either, although it is open.

angyaghllakaa [aŋyáɣ̣ɬaka·] 'it is his big boat';
no inherent stress; rhythmic stress (3) on *-yagh-* and also on *-kaa*, which being final loses its stress (4) and therefore is not overlengthened but is still longer than *-ka* in the preceding example.

2.2. Stem-stress principle in SY

SY has a process whereby stress is kept whenever possible on the stem of a word with suffixes. The other Yupik languages also have processes which achieve this effect, although the process in SY differs from those of CY and Alutiiq. These processes all serve the "stem-stress principle": inasmuch as the stem is usually the most, or at least the first, meaningful part of the word, it should be the first part of the word to receive stress. As we shall see, this is borne out in both SY and CY by the exemption from the stem-stress principle of certain semantically "empty" or minimally meaningful bases.

In SY the stem-stress principle is served by the following Initial Syllable Lengthening Rule (ISL):

> The vowel (if full) of the initial syllable of a word with suffixes will be lengthened if necessary to put the first stress of the word on the stem rather than on a suffix. Exempted are vowels of three open, monosyllabic, and semantically "empty" bases, *sa-* 'something, to do something', *pi-* 'thing, to act', and *ki-* 'who, someone'.

Note that ISL is morphologically conditioned, unlike the stress rules discussed above. In terms of the point at which the standard orthography represents the language, ISL operates to shape the word before that point, while the stress rules operate after that point. Thus, length due to ISL is written with double vowel as is any phonemic length, while prosodic length is not so written.

An example of the operation of ISL is that from *ateq* [atəq] 'name', with base *ategh-*, comes *aatghani* [á·tɣani] 'in his name', where ISL operates, since otherwise one would have **atghani*

[atχá·ni] where the first stress would not be on the stem. Compare this with *atepik* [atə́pik] 'real name' from the same base, where ISL does not operate, since in *atepik* stress falls on *-te-*, which is still part of the stem. With a few exceptions, vowel-initial suffixes, such as that which yields *aatghani*, cause *e* to be deleted from bases such as *ategh-*, while consonant-initial suffixes, such as that which yields *atepik*, do not. Invariably, however, if *e* is deleted, then *a* is lengthened. In the past, ISL has been termed "e-hopping" for this reason.[7]

Again, in *iigna* [í·ɣna] 'the one over there', ISL has lengthened *i* to keep the stem stressed, for in *tazigna* [tazíɣna] 'that one over there', formed with basically the same stem and suffix as *iigna* with the affixation of *taz-* (the only prefix in the language), ISL does not operate, since even with short *i* the stem is stressed rhythmically by rule 2a. This is a clear case of ISL without deletion of *e*.

An example which illustrates how the "empty" bases *sa-*, *pi-*, and *ki-* are exempt from ISL is provided by the homophones *sata* [sata], with base *sate-*, meaning (1) 'device for doing something' and (2) 'skin side of a pelt'. With meaning (1) *sata* is from the "empty" base *sa-* 'to do something', while with meaning (2) it is not from this base. When the postbase *-ngu-* 'to be' and the ending *-luni* are added, we have (1) *satnguluni* [satŋú·luni] '(it) being a device' and (2) *saatngúluni* [sá·tŋulú·ni] '(it) being the skin side'. ISL operates only in (2), not in (1) where the base is empty and exempt from ISL.

ISL is also reflected in historical processes evident in SY. For example, the CY, Alutiiq, and Inupiaq base meaning 'to spill' is *kuve-*, but in SY there are forms such as *kuuvuq* [kú·vuq] 'it spilled', where the long *u* is evidence of ISL. However, unlike the case of *aatghani* 'in his name' and *atepik* 'real name' discussed above, where ISL was seen to be a productive process, in SY the base 'to spill' has become fixed as *kuuve-* with long *u*. Almost all words built on the base 'to spill' have long *u* in SY, even where this length is not needed to keep stress on the stem. Thus, SY has *kuuvellequq* [kú·vəɬə́quq] 'it will spill', although even if *u* were not long, stress would still be on part of the stem, **kuvellequq* [kuvə́ɬequq], as it is in *atepik* 'real name'. There are, however, a few lexicalized derivatives such as *kuvugh-* 'to spill around', as in *kuvughaa* [kuvú·ɣa·] 'he spilled it around', which have not been affected by ISL.

SY verb bases consisting of a first syllable with a full vowel followed by a second syllable of the form C*e* all have permanently lengthened vowels (historically through ISL), though often with certain derivatives without lengthened vowels (as with *kuuve-* and *kuvugh-* above). Another example is *aange-* 'to be big' (cf. CY *ange-*) and its derivative *angli-* 'to grow'. On the other hand, SY verb bases consisting of a first syllable with a full vowel followed by a second syllable of the form C*egh* or C*eg* do not have permanently lengthened vowels. Lengthening with these bases occurs as a productive process of ISL, though there are some derived forms where ISL has not occurred. For example, from the base *itegh-* 'to enter' comes *iteghtuq* [itə́χtuq] 'he entered' (ISL not applicable), *iitghi* [í·tχi] 'enter!' (ISL operating), *itghumaaq* [itχú·ma·q] 'he stayed in' where, contrary to what one might expect, ISL has not operated, this form being lexicalized.

The pair of related bases *niive-* 'to pour' and *nivugh-* 'to pour around" would seem to show a relationship similar to that of *kuuve-* 'to spill' and *kuvugh-* 'to spill around'. However, *nivugh-* is apparently derived from *niive-* through erroneous analogy, for whereas SY *kuuve-* arises from proto-Yupik **kuve-* (cf. CY *kuve-*) through ISL, SY *niive-* arises from earlier **naive-* (cf. CY *naive-*) through the SY process of "vowel assimilation."[8] Thus, the shortening of *i* in *nivugh-* has

[7] See Krauss 1975:58-59 and Jacobson 1977:10. The term "e-hopping" proves somewhat misleading, since it suggests that ISL occurs if and only if a final or semi-final *e* is deleted from a base, whereas it also occurs in cases where no *e* has been deleted, and it also fails to occur in some cases where an *e* has been deleted, as examples in the text show. Nevertheless, ISL is often associated with deletion of *e* from short bases, as the term "e-hopping" suggests.

[8] By "vowel assimilation" clusters of unlike vowels are prevented in SY. The vowel *i* dominates both *a* and *u*, so that any underlying or historic cluster containing *i* becomes *ii*. Any cluster of *a* with *u* becomes *aa*. See Krauss 1975:53-54 and Jacobson 1977:15 for further details.

no historical explanation other than analogy, or by the interpretation that the postbase *-ugh-* shortens the *u* in *kuuve-* to give *kuvugh-* (and the *i* in *niive-* to give *nivugh-*), rather than attaching to *kuve-* at a pre-ISL stage, with the resulting base being lexicalized to the extent that ISL does not subsequently occur.

There are many other cases of long vowels in initial syllables in SY which correspond to short vowels in other Yupik languages (and a few cases of short vowel in SY corresponding to long vowel elsewhere, as in SY *nivugh-* vs. CY *naivur-*), which seem to be evidence of historical ISL but which are not supported by any other evidence of this having occurred. For example, to SY *maalghuk* [má·lɣuk] 'two' corresponds CY *malruk* [mál·ɣuk], and to SY *naayvaq* [ná·yvaq] 'lake' corresponds CY *nanvaq* [nánvaq]. This suggests historical ISL, but aside from the lengthened vowels in the SY forms, there is nothing to indicate ISL. We have no more evidence that there are two morphemes in *malruk/maalghuk* and *nanvaq/naayvaq* than we do in the case of SY *angyaq* [aŋyaq] 'boat', which corresponds to CY *angyaq* [áŋyaq], and SY *aghnaq* [aɣnaq] 'woman', which corresponds to CY *arnaq* [áɣnaq]. Perhaps there have been a number of cases of initial syllable lengthening through analogy to legitimate ISL for the stem-stress principle. On the other hand, there may be undiscovered and perhaps undiscoverable morphological and/or phonological grounds for the disparity between pairs such as *malruk/maalghuk* or *nanvaq/naayvaq* where lengthening occurs in SY, and pairs such as *angyaq/angyaq* or *arnaq/aghnaq* where lengthening does not occur.

3. Central (Alaskan) Yupik (CY)

There are four dialects of CY: (1) "General" Central Yupik (GCY) spoken on the Yukon, Kuskokwim, and Nushagak rivers, Nelson Island, Bristol Bay, and Lake Iliamna; (2) Norton Sound (NS) spoken in Kotlik and by parts of the populations of St. Michael (which also has GCY speakers), Unalakleet, Elim, and Golovin (all of which also have Inupiaq speakers); (3) Hooper Bay-Chevak (HBC), spoken in those two villages; and (4) Nunivak, spoken in Mekoryuk, the only village of Nunivak Island. GCY may be divided into subdialects, but such division is not of interest as far as prosody is concerned. NS may also be divided into two subdialects which differ in their prosody: the northern subdialect, Norton Sound-Unaliq (NSU), spoken in St. Michael, Unalakleet, Elim, and Golovin; and the southern subdialect, Norton Sound-Kotlik (NSK), presently restricted to Kotlik but formerly spoken in several nearby and now uninhabited villages. This investigation of CY prosody will begin with NSU, which is the CY dialect closest to SY, will proceed to NSK, which is transitional between NSU and GCY, will then proceed to GCY, and will conclude with HBC and NUN, both of which share certain features with Alutiiq.

3.1. Norton Sound-Unaliq (NSU)

As stated above, this northernmost subdialect of CY is closest to SY in prosody—expectably so, since it is geographically closest to Siberia (via the Seward Peninsula, which was more populated by Yupik speakers in the past than at present). NSU is also closer to SY lexically than is the rest of CY.

Prosodic rules for NSU are as follows, arranged and numbered the same as the corresponding rules for SY in section 2.1, again with items in brackets being those not applicable in NSU. Note that unlike SY but like the rest of Eskimo, NSU has gemination and clusters of two unlike vowels.

[1. Prosodic *e* deletion]
2. Inherent stress (i.e., stress independent of rhythm)
   a. Initial closed syllables are stressed (ICSS) *(new here)*
   b. Heavy syllables are stressed
   [c. Regressive stress]
3. Rhythmic stress: the syllable following an unstressed syllable is stressed

4. Final syllable de-stressing: a final syllable loses stress
5. Rhythmic lengthening
   a. A full vowel in a stressed open light syllable is lengthened
   [b. Overlengthening] *(SY process not here)*
6. Automatic gemination
   a. The consonant following a stressed *e* in an open syllable is geminated *(new here)*
   b. The initial consonant of a heavy syllable is geminated following an open light unstressed syllable *(new here)*
7. Secondary stress: the syllable preceding a heavy syllable is stressed *(new here)*

These rules differ from those of SY in two main ways. First, NSU has initial closed syllable stress (ICSS). Second, NSU does not have overlengthening of heavy vowels, but instead has automatic gemination ("automatic" in contrast with phonemic gemination) and secondary stress.[9] It should be pointed out that automatic gemination sounds the same as phonemic gemination, and that secondary stress sounds the same as any other stress (but is termed "secondary" here because of the late stage at which it is assigned).

Examples:

angyarpangyugtuq [áŋyaχpáŋyuxtuq] 'he wants to get a big boat';
inherent stress (2a) on *-ang-;* rhythmic stress (3) on *-pang-* and *-tuq*, the last being de-stressed (4). Note ICSS in NSU but not in SY; cf. SY *angyaghllangyugtuq* [aŋyáχɬaŋyúxtuq] 'he wants to get a big boat'.

qayarpangyugtuq [qayáχpaŋyúxtuq] 'he wants to get a big kayak';
no inherent stress; rhythmic stress (3) on *-yar-* and *-yug-*. Same as in SY.

angyamini [áŋyamí·ni] 'in his own boat';
inherent stress (2a) on *-ang-;* rhythmic stress (3) and length (5a) on *-mi-*. Note ICSS in NSU but not in SY; cf. SY *angyamini* [aŋyá·mini] 'in his own boat'.

qayani [qayá·ni] 'his own kayak';
no inherent stress; rhythmic stress (3) and length (5a) on *-ya-*. SY is the same.

qayaani [qáy·á·ni] 'in his (another's) kayak';
inherent stress (2a) on *-yaa-*, which is not longer than rhythmically lengthened *-ya-* in the preceding example, but which being a heavy syllable causes *y* to be geminated (6b), since the preceding syllable is open, light, and unstressed; secondary stress (7) on *-qa-*. Cf. SY *qayaani* [qayá:ni] and note how automatic gemination and secondary stress in NSU play the role that overlengthening does in SY to distinguish between rhythmically lengthened vowels and phonemically long vowels, as in *qayani* vs. *qayaani*.

atepik [atə́p·ik] 'real name';
no inherent stress; rhythmic stress (3) on *-te-;* the following *p* is geminated (6a). Cf. SY *atepik* [atə́pik] where stressed *e* is permitted in an open syllable, whereas in NSU the syllable is closed by gemination when *e* is stressed.

[9] Overlengthening does not occur in NSU or elsewhere in CY in the same sense that it occurs in SY. In CY a stressed (i.e., non-final) heavy open syllable may be slightly longer than a closed heavy syllable in the same position would be, but unlike overlengthening in SY, this phenomenon in CY is slight to the point of being marginal, and is potentially distinctive, if ever, only under strictly limited circumstances (see the discussion of *rar*-contraction in GCY, below).

qayapigkani [qayá·pixká·ni] 'his own future authentic kayak';
no inherent stress; rhythmic stress (3) and therefore length (5a) on *-ya-* and *-ka-*. SY is the same.

qayapigkaani [qayá·píxká·ni] 'in his (another's) future authentic kayak';
inherent stress (2b) on *-kaa-*, rhythmic stress (3) and therefore length (5a) on *-ya-*; secondary stress (7) on *-pig-*. The length of *-kaa-* in this example is the same as that of rhythmically lengthened *-ka-* in the preceding example, but in this example *-pig-* has (secondary) stress, while in the preceding example *-pig-* is unstressed. Cf. SY *qayapigkani* [qayá·pixká·ni] vs. SY *qayapigkaani* [qayá·pixká:ni], where overlengthening rather than secondary stress distinguishes the underlying vowel lengths.

From these examples we see that initial closed syllables are stressed in NSU but not in SY, that automatic gemination closes an underlying open syllable with stressed *e* in NSU but not in SY, and that phonemically long vowels are distinguished from rhythmically lengthened phonemically short vowels in SY through the process of overlengthening and in NSU through the processes of automatic gemination and secondary stress.

3.2. Stem-stress principle in NSU and CY in general

As we have seen, the rule that serves the stem-stress principle in SY is Initial Syllable Lengthening (ISL). In NSU (and the rest of CY and Alutiiq as well), the stem-stress principle is served by Initial Closed Syllable Stress (ICSS) and a morphologically conditioned rule, "Initial Syllable Closure" (ISC), which operates in CY at the same level as ISL in SY, and which exempts the same three open, monosyllabic, semantically "empty" bases. ISC states:

> The initial open syllable of a word with suffixes will be closed by gemination of the initial consonant of the following syllable if needed to put the first stress of the word on the stem rather than on a suffix. Exempted are words derived from the three open, monosyllabic, semantically empty bases *ca-* 'something, to do something', *pi-* 'thing, to act', and *ki-* 'who, someone'.

ISC thus creates input for ICSS by closing initial syllables so that they will be inherently stressed by ICSS.

An example of the operation of ICSS alone, without need for ISC to serve the stem-stress principle, is that from *ateq* [atəq] 'name', with base *ater-*, comes *atrani* [átr̥ani] 'in his name', where ICSS alone puts stress on the stem. Compare SY *ateq* 'name' but *aatghani* [á·tɣani] 'in his name', where ISL is needed to put stress on the stem, since SY lacks ICSS.

An example of ISC creating input for ICSS to serve the stem-stress principle is that from the base *kuve-* 'to spill' comes *kuv'uq* [kúv·uq] 'it spills', where without ISC-generated gemination closing the initial syllable so that ISC can stress it, we would have **kuvuq* [kuvuq], lacking stress on the stem. Also from the base *kuve-* are *kuvluni* [kúvluni] '(it) spilling', with stress on the stem through ICSS alone without need of ISC, and *kuvenqigtanka* [kuvə́nqixtánka] 'I spilled them again', with stress on the stem (since *-ven-* is a stem syllable up to the closing consonant), even without ISC. Compare this with the situation in SY, discussed above where the vowel of the base is always long (except in a few lexicalized derivatives) even when not necessary to keep stress on the stem.

A further example of ISC and ICSS serving the stem-stress principle in NSU is that from *ena* [ənа] 'house' with base *ene-* comes *nek'aqa* [nə́k·aqa] 'it is my house'. An older form for 'it is my house' (still in use in HBC, NUN, and Alutiiq, but not in GCY, which does as NSU here) is *enkaqa* [ə́nkaqa], where the stem is stressed by ICSS alone without ISC. In the NSU form, however, the initial *e* drops, triggering the operation of ISC to avoid **nekaqa* [nəká·qa] without stress on the stem.

As we have seen, the application of ISL, or lengthening akin to ISL, gives SY words such as *maalghuk* [málɣuk] 'two' and *kuuvellequq* [kú·vəɬəquq] 'it will spill', where lengthening occurs without being required by the stem-stress principle. Likewise in NSU there is evidence of the historical occurrence of gemination which parallels, extends, or is modeled after ISC without being required by the stem-stress principle. For example, from the underlying CY base *englar-* 'to laugh', as in *englartuq* [əŋlaχtuq] 'he is laughing' (as still used in NUN, and corresponding to Inupiaq *iglaqtuq* [iɣlaqtuq] 'he is laughing'), we have the NSU (and GCY) form of this base, *ngel'ar-*, as in *ngel'artuq* [ŋəl·aχtuq] 'he is laughing'. The gemination in going from *englartuq* to *ngel'artuq* is not required by the stem-stress principle, since the stem would still be stressed in the absence of such gemination: **ngelartuq* [ŋəláχtuq]. Rather, the gemination keeps the stress in *ngel'artuq* on the first syllable, where it is in the older form *englartuq*. The gemination in this case seems to be modeled after ISC, as it operates to serve the stem-stress principle as in going from *enkaqa* to *nek'aqa* 'it is my house', discussed above.

3.3. Lenis vs. fortis voiced fricatives in NSU

Before turning our attention to the other dialects of CY, it is useful to discuss one feature, unique to NSU among CY dialects, which forms a bridge to "consonant weakening," the manifestation of Yupik-style prosody in Seward Peninsula Inupiaq. Each CY dialect in its own way alternates between "lenis" and "fortis" voiced fricatives, depending primarily upon phonological environment and secondarily upon morphological considerations.[10] By "lenis" voiced fricatives is meant sonorant [w], [y], and [l], while the corresponding "fortis" voiced fricatives are [v], [z], and a lateral here represented [ɮ], which has a much stronger fricative rather than sonorant articulation than does lenis or sonorant [l].[11] There is also a very slight difference between lenis and fortis [ɣ] and between lenis and fortis [ɣ]. The NSU pattern is that if a light syllable following a closed syllable begins with a fricative, then that fricative will be fortis if the preceding syllable is stressed, but lenis if the preceding syllable is not stressed. For example, the fricatives which begin the third syllable are fortis in *mayurvik* [mayúɣvik] 'place to go up', *mayursugtuq* [mayúɣzuxtuq] 'he wants to go up', and *mayurluni* [mayúɣɮuni] '(he) going up', because the preceding (second) syllable is stressed in each case. On the other hand, the fricatives which begin the third syllable are lenis in *atrarvik* [átχaɣwik] 'place to go down', *atraryugtuq* [átχaɣyúxtuq] 'he wants to go down', and *atrarluni* [átχaɣlú·ni] '(he) going down', because the preceding (second) syllable is unstressed in each case. This fortis-lenis alternation is extended in Seward Peninsula Inupiaq to include stops as well as fricatives, to apply to both consonants in a cluster and to weaken certain fricatives to ∅. This prosodic "consonant weakening" in Seward Peninsula Inupiaq follows the prosodic pattern of the NSU dialect of CY, with which it is geographically contiguous. For a full exposition see Kaplan's article on Seward Peninsula Inupiaq in this volume.

3.4. Norton Sound–Kotlik (NSK)

NSK is intermediate between NSU and GCY, or more generally between NSU and the rest of CY (i.e., GCY, HBC, and NUN). NSK, like NSU but unlike GCY/HBC/NUN, has no rule of "regressive stress" (to be discussed below). However, NSK, like GCY/HBC/NUN and unlike NSU, does have a rule of "prosodic *e*-deletion" (to be discussed below). Alternation between lenis and fortis fricatives in NSK is not prosodic as in NSU.

3.5. General Central Yupik (GCY)

GCY includes the vast majority of CY speakers. The prosodic system of GCY also extends,

[10] See Reed et al. 1977:317-319; Jacobson 1984:30, 32, 36; and Woodbury, 1979.

[11] The standard orthography for CY distinguishes between [y] and [z], writing them as *y* and *s* respectively, but not between [w] and [v], writing both as *v*, nor between [l] and [ɮ], writing both as *l*.

with a few additions, to HBC and NUN. GCY prosodic rules are as follows, where a C_1e/C_2 syllable is an open syllable with the vowel *e* where the following consonant is different from the preceding consonant (*t* and *c* count as the same consonant in this regard, as do *c* and *ń*).

1. Prosodic *e*-deletion
   The *e* of a C_1e/C_2 syllable which is the second in a series of adjacent light open syllables is deleted. *(new here and in NSK)*
2. Inherent stress (i.e., stress independent of rhythm)
   a. Initial closed syllables are stressed (ICSS)
   b. Heavy syllables are stressed
   c. Regressive stress: a closed syllable preceding an open, light, non-final syllable is stressed (unless that open syllable is followed by the final enclitic of the word) *(new here)*
3. Rhythmic stress: the syllable following an unstressed syllable is stressed
4. Final syllable de-stressing: a final syllable loses stress
5. Rhythmic lengthening
   a. A full vowel in a stressed open light syllable is lengthened
   [b. Overlengthening]
6. Automatic gemination
   a. The consonant following a stressed *e* in an open syllable is geminated
   b. The initial consonant of a heavy syllable is geminated following an open, light, unstressed syllable
7. Secondary stress: the syllable preceding a heavy syllable is stressed

GCY adds two rules to NSU, "prosodic *e*-deletion" (1), which is already present in NSK, and "regressive stress" (2c). We shall look first at some examples of regressive stress.

qayapigkani [qayá·píxkani] 'his own future authentic kayak';
regressive stress (2c) on *-pig-*, which is a closed syllable followed by an open syllable; rhythmic stress (3) and length (5a) on *-ya-*; rhythmic stress (3) also on *-ni*, which is de-stressed because word-final (4). See discussion under next example for NSU correlate.

qayapigkaani [qayá·píxká·ni] 'in his (another's) future authentic kayak';
inherent stress (2b) on *-kaa-*; rhythmic stress (3) and length (5a) on *-ya-*; secondary stress (7) on *-pig-*. The rules here are the same in NSU and GCY. Note that GCY uses regressive stress on *-pig-* and consequent lack of rhythmic stress and lengthening on *-ka-* to distinguish the previous example, *qayapigkani* [qayá·píxkani], from the present example, whereas NSU relies on the absence of secondary stress in *qayapigkani* [qayá·pixká·ni] as against its presence in the present example to distinguish the two.

Examples illustrating the special status of enclitics with respect to regressive stress:

qanruski-llu [qán'uskí·łu]'also, tell them!';
inherent stress by ICSS (2a) on *qan-*; regressive stress (2c) fails to fall on *-rus-* even though it is a closed syllable followed by an open syllable, *-ki-*, because *-ki-* comes before the final (and only) enclitic; rhythmic stress (3) and therefore length (5a) on *-ki-* instead.

Compare this with

> *qanruskiki* [qán'ɣúskiki] 'tell them (in the future)!';
> inherent stress by ICSS (2a) on *qan-*; regressive stress (2c) on *-rus-*; rhythmic stress (3) on the final syllable *-ki*, which is then de-stressed (4).

3.6. Prosodic e-deletion in GCY

Prosodic *e*-deletion (rule 1) operates in such a way that generally one cannot tell from the phonetic surface of the word that an *e* deleted by this rule was ever there, the rest of the rules of prosody operating on the output of this rule.[12] The orthography was designed to represent the language *after* this rule has taken effect, although it represents the language *before* the other prosodic rules have taken effect, because one cannot tell without morphological analysis (and not always even then) whether or not certain surface consonant clusters have an underlying *e* which has been deleted by this rule. The following examples will demonstrate the alternations which justify this *e*-deletion as a synchronic phonological rule. In *qanaatekaqa* [qán·á·təká·qa] 'I speak about it', there is clearly an *e* between *t* and *k* at the phonetic surface. In *qanrutkaqa* [qán'ɣútkaqa], also 'I speak about it', there is clearly no *e* between *t* and *k* at the phonetic surface, yet *-t(e)kaqa* is morphologically identical in *qanaatekaqa* and *qanrutkaqa*, the latter comes from underlying *qanrutekaqa* (as still in NSU, [qán-ɣutə́k·aqa]), and *e* is deleted in the GCY form because *-te-* is a C_1e/C_2 syllable and is the second in a series of adjacent light open syllables, the first being *-ru-*, thus meeting the conditions for rule 1. Although *-te-* is also a C_1e/C_2 syllable in *qanaatekaqa*, it is the first, not the second, in a series of adjacent light open syllables, so that conditions for deleting the *e* are not met. Thus such *e*-deletion is indeed prosodic rather than morphological, although it occurs before other prosodic rules take effect.

As another example of the operation of prosodic *e*-deletion, consider underlying *atepik*, which becomes *atpik* [átpik] in GCY by this rule (1) but which remains *atepik* [atə́p·ik] in NSU in the absence of this rule, with automatic gemination (6a) closing the stressed *e* syllable as shown. On the other hand, in underlying *ateteng* [atə́t·əŋ] 'their own names', the rule does not apply, because the *e* is flanked by two like consonants. GCY treats *ateteng* as NSU does, rhythmically stressing the syllable in question and closing it by gemination by rule 6a.

The prosodic environment in which *e* is deleted from underlying *atepik*, yielding *atpik*, is the same as that in alternating syllables which causes *e* to be stressed (and therefore closes its syllable) in *ateteng* or, for that matter, which causes the second *a* to be stressed (and then lengthened) in *qayani* 'his own kayak'. I have, however, separated these rhythmic rules into rule 1 (prosodic *e*-deletion) and rule 3 (rhythmic stress), with rule 2 (inherent stress) intervening. One might well wonder if the two rhythmic processes might be combined. One might try to eliminate rule 1 and instead add a rule between rule 5 and rule 6, stating that stressed *e* in a C_1e/C_2 syllable (i.e., in an open syllable and flanked by unlike consonants) is deleted. This would make prosodic *e*-deletion a consequence of a single rhythmic stress rule (3), like rhythmic length (rule 5a), and automatic gemination, which is triggered by stressed *e* in a non-C_1e/C_2 open syllable (rule 6a). Such a reformulation would not work, however, at least not without considerable modification (though see section 5, where it will work

[12] Prosodic *e*-deletion will, however, result in an otherwise non-occurring cluster of a voiced and voiceless consonant, if the consonants flanking the deleted *e* are underlyingly such. For example, underlying *atelek* [atə́lək] becomes *at'lek* [átlək] 'one with a name' by prosodic *e*-deletion, hence its cluster of a (voiceless) stop *t* and a voiced fricative *l*. The apostrophe is used in the standard orthography to indicate that the *l* is not automaticallydevoiced by the *t* (as provided for in the orthographic rules concerning fricative undoubling next to a voiceless consonant). In the Yukon subdialect of GCY, prosodic *e*-deletion can result in a cluster of voiced followed by voiceless (e.g. *kuv'ciquq* [kúvciquq] 'it will spill') or voiceless followed by voiced (e.g. *at'lek*). In the Kuskokwim-Bristol Bay subdialect of GCY, however, a voiced consonant preceding a voiceless consonant will become voiceless (e.g. *kuv'ciquq* becomes *kuvciquq* [kúfciquq]).

with the stress pattern discussed there with only limited modification). From underlying *qanrutekaqa* [qán˩yutə́kaqa] 'I speak about it' and *qanrutekagka* [qán˩yutə́kaxka] 'I speak about them', it would give *qanrutkaqa* [qán˩yutkaqa] and *qanrutkagka* [qán˩yutkaxka], without any stress beyond the inherent stress on *qan-* in both words, while in fact *qanrutekaqa* and *qanrutekagka* yield *qanrutkaqa* [qán˩yútkaqa] and *qanrutkagka* [qán˩yutkáxka] respectively. After *e*-deletion in each case, stress on syllables in the neighborhood of the deleted *e* is assigned as if the *e* had never been there, falling regressively on *-rut-* in the first word and rhythmically on *-kag-* in the second word. Our division of rhythmic rules into rule 1 and rule 3 is necessitated by such reassignment of stress after *e*-deletion.[11] In an appendix to this article (Section 4.1) I discuss alternative formulations of the prosodic rules to integrate the two rhythmic processes, making the modifications required for such an integrated system to work.

3.7. Stress-repelling bases in GCY

As discussed earlier, the mechanisms of the stem-stress principle, ISL (Initial Syllable Lengthening) in SY and ISC (Initial Syllable Closure) in NSU (and the rest of CY) exempt the three semantically "empty" bases *sa-* (SY)/*ca-* (CY) 'what, something, to do something', *pi-* 'thing, to act', and *ki-* 'who, someone'. In the Kuskokwim-Bristol Bay subdialect of GCY, and probably elsewhere in GCY, and possibly in other dialects of CY as well, these three "empty" bases are exempt not only from ISC (Initial Syllable Closure), but also from the other GCY rule serving the stem-stress principle, namely ICSS (Initial Closed Syllable Stress). The three bases in question are "stress-repelling" in that they shift the first stress of the word from stem to suffix; the stem-stress principle does not operate in the case of these semantically "empty" bases.

An example showing the exemption of these stress-repelling bases from ISC is *canguq* [caŋuq] 'he acquires something', from the stress-repelling base *ca-* 'something', where ISC does not occur, since *ng* is not geminated. Compare this with *kuv'uq* [kúv·uq] 'it spills', where *v* is geminated by ISC, or with *cang'uq* [cáŋ·uq] 'he catches fish', from the lexicalized base *cange-* 'to catch fish' (also from *ca-* 'something' but now a base in its own right and therefore subject to ISC). Another example where ISC does not occur is *pikaqa* [piká·qa] 'it is my thing' from the stress-repelling base *pi-* 'thing'. Compare this with *nek'aqa* [nə́k·aqa] 'it is my house', where ISC does occur.

The examples above showing the failure of ISC apply to all dialects of CY. The following examples show the exemption of the stress-repelling bases from ICSS and apply specifically to the Kuskokwim-Bristol Bay subdialect of GCY. Although the standard orthography does not provide a means to indicate a difference, *cangyugciqsugnarquq* can be stressed in two different ways. It may be stressed normally according to the rules given above, so that ICSS assigns stress on the first syllable, and then there is rhythmic stress on the third and fifth syllables, [cáŋyuxcíqsu˩ynáχquq], in which case *cange-* is to be taken as the lexicalized base 'to catch fish' and the word means 'he probably will want to catch fish'. On the other hand, the word may be pronounced without stress on the first syllable, even though that syllable is closed, so that rhythmic stress falls instead on the second and fourth syllables, [caŋyúxciqsú˩ynaχquq], in which case *ca-* is the stress-repelling base not in lexicalized combination, and the word means 'he probably will want to acquire something'. Another example is *kinkugnun* [kinkú˩ynun] 'to whom (dual)', where ICSS fails because the base *ki-* is stress-repelling, to be compared with *kankugnun* [kánku˩ynun] 'to those (dual)' down there', where ICSS operates normally because the base is not stress-repelling.

Stress-repelling bases, although exempt from ICSS, are not exempt from regressive stress (rule 2c), as in *piksagutaa* [píksa˩yú·ta·] 'he got it as his thing', nor from secondary stress (rule 7), as in *cakau* [cák·au] 'what is it to him?'.

[11] See section 5.

3.8. Hooper Bay–Chevak (HBC)

The HBC dialect follows the same stress rules as GCY, except that the environment for prosodic *e*-deletion is broadened to include all open syllables with the vowel *e*, whether it is flanked by unlike or like consonants. Stressed *e* in an open syllable thus never occurs past rule 1, prosodic *e*-deletion, eliminating one of the two circumstances under which automatic gemination occurs elsewhere in CY, that is, after stressed *e* in an open syllable (rule 6a). Most importantly, however, HBC has the phenomenon of "compression" (also found in slightly different form in NUN and Alutiiq), which considerably modifies prosody.

Let us first compare HBC treatment of stressed *e* in an open syllable with what happens elsewhere. To summarize, in SY such an *e* is stressed, though not lengthened as a stressed full vowel in an open syllable is; in NSU such an *e* is stressed, and in accordance with certain strictures of CY (but not of SY) which prohibit stressed *e* in a phonetically open syllable, the syllable is closed by gemination (rule 6a); in NSK and GCY, such an *e* is deleted (rule 1) unless it is flanked by like consonants, in which case the syllable is closed by gemination as in NSU. Thus, underlying *atepik* [atə́pik] 'real name' and *ateteng* [atə́təŋ] 'their own names' keep these surface forms in SY, become respectively *atepik* [atə́p·ik] and *ateteng* [atə́t·əŋ] in NSU, hence *atpik* [átpik] but still *ateteng* [atə́t·əŋ] in NSK and GCY, and finally *atpik* [átpik] and *at'teng* [át(̥)təŋ] in HBC. This last form has a released *t* closing the first syllable and a second release of *t* beginning the second syllable,[14] in clear contrast with the geminate as in *at'enguq* [át·əŋuq] 'he begins to get dressed'.

The contrast between these rearticulated consonants and long (geminate) consonants is easy to hear in the case of stops, with two distinct releases as opposed to one; in the case of continuants, however, the contrast is phonetically much more subtle, with the rearticulated continuants distinguished from the geminates by two pulses with intervening relaxation though not full release of the stricture, as in HBC *ull'lluku* [úɬɬuku] 'turning it inside out', *kuv'vik* [kúvvik] 'place of spilling', and *tum'mi* [túmmi] 'in the footprint' (cf. GCY *ullelluku* [uɬə́ɬ·uku], *kuvevik* [kuvə́v·ik], *tumemi* [tumə́m·i]), as opposed to *all'uku* [áɬ·uku] 'putting it on', *kuv'i* [kúv·i] 'spill something!', *tumii* [túm·i·] 'his footprint'.

3.9. Compression in HBC

The process of compression[15] follows the operation of the prosody rules on the syllable in question. The HBC rule is,

> 8. Compression: a heavy closed non-final syllable is pronounced short.

Note that the standard orthography represents the language at a stage before the prosody rules apply and therefore also before compression, so that pre-compression length is still represented by double vowels. A compressed syllable is stressed; a heavy syllable can be de-stressed only when word-final, and in this position compression does not occur in HBC. Compression applies to heavy syllables containing two like or two unlike vowels, but we shall need to discuss consequences only for cases where the vowels are like, for if the vowels of the compressed syllable are unlike, their identity remains unaffected. A word with such a syllable is easily distinguishable from any other word having a light syllable where the word in question has a compressed syllable. Thus *kaigtuq* 'he is hungry', even with *kaig-* compressed, remains distinct from **kagtuq*, **kigtuq*, **kugtuq*, and **kegtuq*, in vowel timbre if not in length.

[14] Such a cluster of released consonant closing one syllable and another instance of the same consonant beginning the next syllable can occur for some GCY speakers with the enclitic *-qaa*, which marks a "yes/no" question. These speakers can optionally pronounce *angyaq-qaa* as [áŋyáq[ə]qa·] 'the boat?', in contrast to *angyaqaa* [áŋyáq·a·] 'it is his boat', or the former may optionally be pronounced as homophonous with the latter, with a geminated *q*.

[15] The term "compression" was first used by Jeffrey Leer who investigated the phenomenon in Alutiiq and was also the first to notice it in the speech of a CY speaker from Hooper Bay.

The most interesting cases are those in which the compressed syllable has like vowels and where there is the question of its losing its identity as a heavy syllable. If a light syllable in the place of a compressed heavy syllable would not be stressed, then the stress on the compressed heavy syllable differentiates the two. For example, HBC *maqikaatgun* [maqí·kátxun] 'with their (others') future steambath material', where *-kaat-* is compressed, i.e., shortened but still stressed, contrasts with HBC *maqikatgun* [maqí·katxun] 'with the future steambath materials', where *-kat-* is not stressed. On the other hand, if a light syllable in place of the compressed heavy syllable would also be stressed, then surface contrasts remain in only some environments. We may distinguish the following possibilities: (1) preceding syllable unstressed and open; (2) preceding syllable unstressed and closed; (3) preceding syllable stressed and open; (4) preceding syllable stressed and closed; and (5) no preceding syllable.

In case (1), preceding syllable unstressed and open, differentiation is on the basis of gemination (rule 6b). For example, HBC *qayaatgun* [qáy·átxun] 'with their (others') kayak', where *-yaat-* is compressed but geminated, contrasts with HBC *qayatgun* [qayátxun] 'with the kayaks', where *-yat-* is rhythmically stressed but *y* is not geminated. In case (2), preceding syllable unstressed and closed, differentiation is on the basis of secondary stress (rule 7). For example, HBC *angyarkaatgun* [áŋyáɣkátxun] 'with their (others') future boat', where *-kaat-* is compressed and *-yar-* has secondary stress, contrasts with HBC *angyarkatgun* [áŋyaɣkátxun] 'with the future boats', where *-kat-* is stressed rhythmically but *-yar-* does not have secondary stress (since *-kat-* is light).

In the environments for case (3), preceding syllable stressed and open, and case (4), preceding syllable stressed and closed, a light syllable in the position in question (after a stressed syllable) can be stressed only by secondary stress or by regressive stress. For example, we might compare for case (3) HBC *tuquciiqnia* [tuqú·cíqn̥ia] 'he says she will kill it' with HBC *tuquciqnia* [tuqú·cíqn̥ia] (with secondary stress on *-ciq-*] 'he says she will die', and for case (4) HBC *tupagciiqnia* [tupáxcíqn̥ia] 'he says she will wake him' with HBC *tupagciqnia* [tupáxcíqn̥ia] (with secondary stress on *-ciq-*) 'he says she will awaken'. The preliminary results of such comparisons indicate that for some HBC speakers there is no difference, while for others there is a very slight (and perhaps illusory) phonetic difference of greater stress on the compressed syllable than on the secondarily stressed syllable, and/or perhaps Alutiiq-style "fortition" of the consonant beginning the compressed syllable. For details of "fortition" see Leer's article on Alutiiq prosody in this volume.

In case (5), no preceding syllable, i.e. word-initially, no differentiation can be made. For example, HBC *uunra* [únɣa] 'his burn', where *uun-* is compressed, is homophonous with HBC *unra* [únɣa] 'his armpit', where *un-* is stressed by ICSS.[16]

3.10. Nunivak (NUN)

The NUN dialect is the most divergent of CY dialects. Lexically as well as in respect to other features such as compression, NUN is linked to both HBC and Alutiiq. Somewhat scanty documentary evidence from nineteenth-century wordlists suggests that the now apparently defunct "Aglegmute" dialect of Bristol Bay may have been a geographic and linguistic link between NUN and Alutiiq.[17]

NUN follows GCY prosodic rules, as does HBC, and has compression as in HBC but further-reaching. The NUN rule is:

[16] The standard orthography does not specify what to do in cases such as this. With [únɣa] 'his burn' vs. [únɣa] 'his armpit' it is possible for an HBC speaker to tell that the first has an underlyingly long but compressed *u* while the second has an underlyingly short *u* through morphological analysis without going beyond his dialect, by noting that 'burn' is *uuneq* [ú·nəq] and 'armpit' is *uneq* [unəq] (compression does not occur when the syllable is open). In other cases, where no form of the word in question will have the syllable in question open, an HBC speaker cannot tell if compression has occurred without going beyond his dialect, as in the case of [císquq] 'knee' (GCY *ciisquq*, not **cisquq*).

[17] See Jacobson 1984:627-628.

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9. Compression: (i) A heavy, closed, non-final syllable is pronounced short, and (ii) a heavy final syllable (closed or open) is pronounced short, and (iii) a compressed syllable loses its stress if a short syllable in the same position would be unstressed.

Thus, NUN adds (ii) and (iii) to the compression rule (i) of HBC.[18] By (ii) all final heavy syllables (closed or open) are compressed in NUN, whereas in HBC no final syllable is compressed. By (iii) a compressed heavy syllable cannot be distinguished from a light syllable in the same position except through gemination or secondary stress on the preceding syllable; that is, differentiation is possible only if the syllable preceding the syllable in question is unstressed (open or closed). Some examples of compression in NUN: *maqikaatgun* [maqí·katxun] 'with their (others') future steambath material', homophonous with *maqikatgun* [maqí·katxun] 'with the future steambath material'; *qayaqaa* [qayá·qa] 'it is his kayak', homophonous with *qayaqa* [qayá·qa] 'my kayak'; but *angyaqaa* [áŋyáq·a] 'it is his boat', distinguished by gemination and secondary stress from *angyaqa* [áŋyaqa] 'my boat'.

NUN has a prosody-related process not found elsewhere in CY but also found in some Alutiiq dialects: a geminated voiceless fricative becomes voiceless, thus, NUN *piyuitut* [pís·úitut][19] 'they never do', where geminated *y* is devoiced to [s]. Compare GCY [píy·úitut] for the same word, and NUN *caliyuitut* [calí·yúitut] 'they never work' where the same postbase *-yuite-* 'never' occurs, but the *y* is not devoiced, since it is not geminated because of the preceding syllable's being stressed. Similarly, contrast NUN *pilua* [píl·ua] '(I) doing', GCY [píl·ua] for the same word, but NUN and GCY *calilua* [calí·lua] '(I) working', where *l* is not geminated.

3.11. rar-contraction and related processes affecting prosody in various CY dialects

Each CY dialect has a process of "*rar*-contraction"[20] which affects prosody, but the process differs considerably in detail from dialect to dialect. It is not found in SY or Alutiiq. *rar*-contraction is an optional process, but one that has become almost obligatory for most speakers nowadays. In most CY dialects there are several related or at least similar processes: "*a*-deletion" between *r* (or *g*) and *q* under certain circumstances; and *rur*-contraction and *rir*-contraction, to be discussed at the end of this section. The process of *rar*-contraction can be stated as follows:

10. *rar*-contraction
A syllable of the form *rar* following a full vowel (and in some dialects following a consonant or *e* depending on formulation) and when not the second syllable of the word, is contracted usually to *r*, but in some dialects under some conditions to *re* or *rer*, when it is followed by a consonant-retaining, consonant-initial suffix, or, in some dialects, by the end of the word.[21]

[18] It is reported (personal communication from Elsie Mather) that for some NUN speakers compression may be as in HBC. Thus, there may be two of more subdialects of NUN, perhaps representing the various villages formerly extant on the island.

[19] The standard orthography does not specify whether to write the underlying voiced fricative, as the *y* in *piyuitut*, or to write the devoiced consonant, e.g. *pissuitut* for this word. Not all geminated voiceless fricatives in NUN are voiceless merely because they are geminated. For example, while [ál·ia] 'his sleeve' is from [aliq] 'sleeve', [tál·ia] 'his arm' is from [taliq] 'arm'. In the case of [ál·ia] and [tál·ia], a NUN speaker could tell by morphological analysis that the first but not the second has a voiceless fricative only due to gemination, but he could not determine the status of the fricative in his [úl·uá·ya] 'her semilunar knife' (GCY [úl·uá·ya]) without going beyond his dialect.

[20] This process has also been termed *ar*-deletion (when first described, in Miyaoka 1973) and *ra*-deletion. It is discussed in Reed et al. 1977, but the present discussion represents a refinement of that earlier presentation.

[21] The contracted *r* or *rer* will be voiced or voiceless depending on whether the following consonant is voiced or voiceless. If the contraction occurs at the end of a word, then the result is word-final *r* rather than the normal word-final form, *q*, of underlying *r*. Apparently, V́γáγ→V́γəγ→V́γ^{ə}γ→V́γ, V́γáχ→V́γəχ→V́χ^{ə}χ→V́χ$^{ə}_{ə}$χ→V́χ, V́γaγ→V́γ^{ə}γ→V́γ, V́γaχ →V́γəχ→V́χ$^{ə}_{ə}$χ, and V́γaq#→V́γəq#→V́χ$^{ə}_{ə}$q#→V́χ, with some dialects stopping the process part way.

We shall examine this for each dialect.

NSU and NSK: Here *rar*-contraction is a productive process only with the postbase *-urar-* 'to keep on doing, to do leisurely'. There are apparent historical occurrences of *rar*-contraction, now lexicalized in several non-productive postbases and several bases. To see the productive process in the one postbase where it occurs, consider *ceńirqurartuq* [cəŋíχquɣáχtuq] 'he is leisurely visiting', optionally *ceńirqu'rtuq* [cəŋíχqúχtuq] with *rar* contracted to *r*, and the preceding syllable receiving what will here be called "compensatory" stress (indicated by an apostrophe in the standard orthography).[22] The effect is that stress becomes taxonomically phonemic in NSU and NSK (as we saw it to be in HBC as a result of compression), for in a word with the same syllable array as *ceńirqu'rtuq* but in which no *rar*-contraction has occurred, there is no stress on the corresponding syllable: e.g. *nayirturtuq* [nayíχtuχtuq] 'he is eating seal'. The effect of compensatory stress on the syllable before the contracted one is that the rhythmic pattern in the rest of the word will be the same as if the contraction had not occurred. Compare the contracted and uncontracted forms, *ceńirqu'rluni-llu* [cəŋíχqúɣluní·ɬu] and *ceńirqurarluni-llu* [cəŋíχquɣáɣluní·ɬu] '(he) also leisurely visiting', as contrasted with a word without *rar*-contraction or its compensatory stress: *nayirturluni-llu* [nayíχtuɣlú·niɬu] '(he) also eating seal' (where, recalling that NSU and NSK lack stress retraction, rhythmic stress falls on *-lu-* after *-yir-*).

After a stressed syllable *rar* is contracted only to *rer* with no alteration in prosody. Thus, *cikuurartuq* [cík·úɣaχtuq] 'it keeps freezing' is optionally *cikuurrertuq*[cík·úχəχtuq], and *cikuurarluni*[cík·úɣaɣlú·ni] '(it) continuing to freeze' is optionally *cikuurerluni* [cík·úɣəɣlú·ni]. Note that the entire sequence *rer* becomes voiceless before a stop.

An example of a presumed lexicalized occurrence of *rar*-contraction is in the NSU word *vuale'rsaq* [yúaləɣzaq] 'crab', where the presence of fortis *s* (i.e., [z]) rather than lenis *y* bears out the fact that the stress on *-le'r-* is compensatory, as is also confirmed by the rhythmic pattern in *yuale'rsamini* [yúaləɣzamí·ni] 'in its own crab'. *Yuale'rsaq* is evidently from underlying **yualerarsaq* [yúaləɣáɣzaq]. Incidentally, the fact that this presumed form cannot now be elicited conclusively establishes stress in NSU as phonemic, according to some theoretical orientations.

None of the processes mentioned above as being related to or similar to *rar*-contraction has been found in NSU or NSK.

GCY: Here the process of *rar*-contraction occurs with almost every base and postbase ending in *rar* following a full vowel.[23] There are a few isolated non-productive occurrences of *rar*-contraction after *e* or, equivalently, after a consonant.[24]

We shall first examine in detail the various conditions for *rar*-contraction following a full vowel and the effect such contraction has on prosody.

(1) *rar* is preceded by a heavy syllable. In this case *rar* contracts to *r*, possibly leaving "compensatory extra length" on the preceding heavy syllable (beyond the length a heavy syllable naturally has). I say "possibly" since I am by no means certain that there is such compensatory length in natural speech. The contracted form of *cikuurartuq* [cík·ú·ɣaχtuq] 'it keeps freezing' is either *cikuurtuq* [cík·ú·χtuq], homophonous with *cikuurtuq* 'it becomes ice', where no *rar*-contraction

[22] Although *rar*-contraction is a late rule applying after the other prosodic rules, nevertheless its effects must be indicated orthographically, since a writer will not necessarily be able to reconstruct the underlying form.

[23] The only postbase found so far which fulfills the conditions for *rar*-contraction but which is never subject to this process is *-niarar-* 'to act soon', as in *ayagniararturuq* 'he is leaving soon'. Perhaps there is no contraction in *-niarar-* in order to avoid homophony with *-niar-* 'so that one might act', as in *ayagniartuq* 'so that he might leave', though such considerations do not block contraction with other postbases.

[24] Given the general instability of *e* in the language, *rar*-contraction after a consonant can generally be interpreted as contraction after an inserted *e*, and conversely.

has occurred, or *cikuurtuq*[25] [cík·ú:χtuq] where the syllable *-kuur-* is slightly longer than a normal heavy syllable in this position (as in 'it becomes ice'). The second contracted form, where contraction leaves compensatory length, is usually given by a speaker after some reflection and as a correction after he has originally given the first form. As such, this compensatory length may be merely a device not occurring in natural speech but serving for some speakers, in metalinguistic discourse, to differentiate two otherwise homophonous words. Such compensatory length is so slight that it would not even be noticeable in normal speech. It may emerge in elicitation situations as a reflection of the combined length of the two syllables *-kuurar-* in the pre-contraction form, since the latter is known to the speaker. Alternately, since *-kuur-* here is from an underlyingly open syllable, its extra length may be from a CY analog of SY "overlengthening," according to which even in CY a non-final open heavy syllable may be slightly longer than the corresponding non-final closed heavy syllable would be, although such CY "overlengthening" would be non-distinctive in all cases other than the present one.

(2) If *rar* is preceded by a stressed light (and therefore rhythmically lengthened) syllable, then the rhythmic length of that preceding syllable is preserved. Thus *ilutequrartuq* [ilú·təqú·ɣaχtuq] becomes *ilutequ'urtuq* [ilú·təqú·χtuq] 'he keeps feeling sad'. Here *rar*-contraction has created a new syllable type, a closed long, and therefore phonetically heavy, syllable that, in violation of rule 6b, does not trigger gemination of its initial consonant, even though the preceding syllable is open, light, and unstressed. (The standard orthography represents this with an apostrophe between the vowels of this sort of syllable, as in *-qu'ur-*, to indicate lack of gemination.)[26]

(3) If *rar* is preceded by an unstressed light syllable, then *rar*-contraction results in compensatory stress on the preceding syllable, as in NSU and NSK. Thus, stress becomes taxonomically phonemic in GCY also, as in the minimal pair *melugturtuq* [məlúxtuχtuq] 'he is eating fish eggs' and *melugtu'rtuq* [məlúxtúχtuq] (from *melugturartuq* [məlúxtuɣáχtuq]) 'he keeps smoking or sucking'.

The above three situations exhaust all possibilities, but there are some interesting variants on (3) if the syllable receiving compensatory stress is in a position where it would be stressed already, either rhythmically, regressively, or secondarily. There is still evidence of contraction in the first case (rhythmic), but not in the second or third cases. As an example of the first case, contrast *neryarturtuq* [nə́ɣyaχtúχtuq] 'he goes to eat', where *-tur-* has rhythmic stress, with *neryartu'rtuq* [nə́ɣyáχtúχtuq] 'he keeps eating berries off the vine' (with *rar*-contraction from *neryarturartuq* [nə́ɣyáχtuɣáχtuq]), where *-yar-* has regressive stress, being a closed syllable followed by an open syllable *-tu-* in pre-contraction form, and contracted *-tu'r-* receives compensatory stress. Note that this minimal pair shows again that *rar*-contraction occurs immediately after stress is assigned to the syllables preceding the point of contraction. As an example of the second case (regressive), *melugturtuten* [məlúxtúχtutən] 'you are eating fish eggs', where *-tur-* has regressive stress since it is followed by an open syllable, is homophonous with *melugturtuten* [məlúxtúχtutən] 'you keep smoking' (*rar*-contraction from *melugturartuten* [məlúxtuɣáχtuten], compensatory stress on *-tur-*). Homophonous also are the two words that exemplify the third case (secondary): *melugturtua* [məlúxtúχtua] 'I am eating fish eggs', where *-tur-* has secondary stress since it is followed by a heavy syllable, homophonous with *melugturtua* [məlúxtúχtua] 'I keep smoking' (*rar*-contraction from *melugturartua* [məlúxtuɣáχtua], compensatory stress on *-tur-*).

To summarize, productive *rar*-contraction in GCY leaves no traces under certain circumstances, but under other circumstances it leaves a trace in the form of otherwise unexplained (compensatory) stress or vowel length.

Non-productive *rar*-contraction in GCY after *e* or a consonant is seen in the "concessive

[25] The standard orthography does not specify any way to indicate such extra length in a heavy syllable. The issue is a subject for future investigation. The information given here is based on the Kuskokwim subdialect of GCY.

[26] See footnote 21.

mood" meaning 'even though'. Thus, from presumed **ayangrarmi* [ayáŋɣaɣmi] or **ayangerarmi* [ayá·ŋəɣáɣmi] comes *ayange'rmi* [ayá·ŋə́ɣmi] 'even though he goes', where *-nge'r-* has compensatory stress (compare *melugtu'rtuq* [məlúxtúχtuq] from *melugturartuq* [məlúxtuɣáχtuq]). *rar*-contraction after *e* or a consonant in GCY is also seen in a few postbases. While this is not a productive process in GCY, it is productive in HBC and NUN.

A process of *rur*-contraction similar to *rar*-contraction is evident for GCY in the postbase *-rurluq* 'poor dear one'. Thus, from underlying **qunguturarurluq* [quŋú·tuɣá·ɣuɣluq] (with stressed open light syllable preceding the *rur* at issue) comes *qungutura'aũrluq* [quŋú·tuɣá·ɣʷluq] 'the poor dear pet' (which is phonetically virtually indistinguishable from *qungutura'urluq* [quŋú·tuɣáuɣluq]). This is parallel to *ilutequrartuq* [ilú·təqú·ɣaχtuq] giving rise to *ilutequ'urtuq* [ilú·təqú·χtuq] 'he keeps feeling sad' by *rar*-contraction, where in the contracted form a heavy syllable follows a light unstressed open syllable without triggering gemination. Further, from underlying **ikamrarurluq* [ikámɣaɣúɣluq] (with an unstressed open light syllable preceding the *rur* at issue) comes *ikamra'ũrluq* [ikámɣáɣʷluq] 'the poor dear sled'. This is parallel to *melugturartuq* [məlúxtuɣáχtuq] giving rise to *melugtu'rtuq* [məlúxtúχtuq] 'he keeps smoking' by *rar*-contraction, leaving compensatory stress after contraction. The one feature that *rur*-contraction adds to *rar*-contraction is that the *r*(i.e., [ɣ]) at the end of the syllable receiving compensatory stress is rounded or labialized, [ɣʷ], orthographically *ũr*. Note that whereas *rar*-contraction is phonologically conditioned and is a productive and even optional process, *rur*-contraction is obligatory but non-productive, occurring with only one postbase.

Evidence of *rir*-contraction in GCY has been found in one base, *tun'e'rnarqe-*, as in *tun'e'rnarquq* [tún·ə́ɣnaχquq] 'it makes one feel embarrassed', which apparently comes from **tunrirnarqe-* (the form expected from base *tunrir-* 'to feel embarrassed' and postbase *-narqe-* 'to cause one to be or do').

GCY has a process of "*a*-deletion" whereby at certain morphological junctures *a* is optionally deleted between *r* (or *g*) and *q*. This could be numbered 10 in our ordered rules. Thus, *igaraqama-llu* [iɣá·ɣaqá·malu] 'and whenever I write' can become *iga'arqama-llu* [iɣá·χqamá·łu]. Here the stress and lengthening pattern remains as it was up to the point in the word where *a* is deleted, but stress and length alter after that. This is unlike *rar*-contraction, which functions so that the stress pattern in the rest of the word is the same after contraction as before. Another example of *a*-deletion is *eritaraqa* [əɣí·taɣá·qa] 'I am plucking it', which optionally becomes *erita'rqa* [əɣí·táχqa] with compensatory stress as in *rar*-contraction. This process of *a*-deletion does not occur in other CY dialects.

a-deletion is a process related to, or similar to, *rar*-contraction and limited to GCY. Another process similar to *a*-deletion and also limited to GCY, but certainly not related to *rar*-contraction, is the optional deletion of *e* in words formed from localis case demonstrative adverbs and the archaic base *ete-* 'to be'. For example, *pikanetuci-llu* [piká·nətú·ciłu] 'also you (pl.) are up above' can become *pika'antuci-llu* [piká·ntucí·łu]. This precisely parallels the situation of *igaraqama-llu* and *iga'arqama-llu* discussed above, but the *e*-deletion discussed here occurs in only one specific construction. It is also, of course, a much later process than prosodic *e*-deletion which, for example, leads from underlying **pakmanetuci-llu* [pákmanətucí·łu] to *pakmantuci-llu* [pákmántucí·łu] 'also you (pl.) are up above out of sight'.[27]

[27] Also, the *e*-deletion from localis case demonstrative adverbs plus *ete-* 'to be', as well as prosodic *e*-deletion, must be distinguished from suffix-conditioned *e*-deletion, which occurs with consonant-retaining suffixes and is a pre-prosodic process, and from a fourth type of *e*-deletion, also pre-prosodic and occurring optionally at certain morpheme junctures. An example of the fourth type, which shows its pre-prosodic nature, is that *qayangeciquten* [qayáŋəcí·qutən] 'you will get a kayak' may optionally become *qayangciquten* [qayáŋciqú·tən]. Note that after deletion, stress both before and after the point where *e* was deleted takes no account of the *e*. Compare with *pikanetuci-llu* [piká·nətú·ciłu] 'also you (pl.) are up there' optionally becoming *pika'antuci-llu* [piká·ntucí·łu].

HBC: *rar*-contraction occurs here also, but the conditions and results of its occurrence differ somewhat from those of NS and GCY. In particular, *rar* is contracted to *re* if the preceding syllable is heavy or is light, open, and stressed (unless the *rar* is followed by C_1VC_2V, where C_1 is a stop, in which case the GCY pattern prevails). For example, *cikuurarluni* [cík·ú·ɣáɣluni] becomes *cikuureluni* [cík·ú·ɣəlú·ni] '(it) continuing to freeze', and *cikuurartuq* [cík·ú·ɣaχtuq] becomes *cikuurretuq* [cík·ú·χ̣tuq] 'it keeps freezing'. Contrast the last with *cikuurtuq* [cík·úχtuq] 'it becomes ice', where compression prevails in HBC. In HBC, *rar*-contraction after a consonant (or *e*) is also productive, so underlying *atrarluni* [átχáɣluni] (as in GCY) becomes *atreluni* [átχəlú·ni] '(he) going down' in HBC.

NUN: *rar*-contraction occurs here as well, but again the conditions and results differ from those elsewhere. In particular, *rar* after a full vowel is contracted to *r*, as in GCY, even in those cases where the HBC contraction yields *re* rather than *r*, but the contraction blocks compression; compression thus precedes *rar*-contraction. For example, *cikuurartuq* becomes *cikuu'rtuq* [cík·ú·χtuχ][28] 'it keeps freezing' with uncompressed long *u*, in contrast to *cikuurtuq* [cík·uχtuχ] 'it becomes ice' with compressed *u*. In NUN, *rar*-contraction after a consonant or *e* is productive as in HBC, although the results differ. Underlying *atrarluni* 'he going down' (as in GCY) becomes *at'erluni* [át·ə́ɣluni]. NUN devoicing of geminates precedes *rar*-contraction. For example, underlying *navrarluni* '(he) borrowing' (as in GCY) becomes *nav'erluni* [náv·ə́ɣluni] in NUN, with geminated but voiced *v*.

4. Appendix on reformulating GCY stress rules

As mentioned in the body of this paper in the discussion of prosodic *e*-deletion in GCY, I consider that there are alternatives to the rules as formulated there for deleting *e* and determining stress, length, and gemination, making prosodic modifications each time to the output of earlier scans. While such a "layered" method of determining prosody is theoretically workable, perhaps especially for an investigator with a word written in the standard orthography or an underlying form which represents the language before even prosodic *e*-deletion occurs, intuitively one may question whether it is an accurate description of the way a Yupik speaker prosodically modifies a word as he pronounces it. Perhaps, instead, the speaker goes through the word from beginning to end only once, performing all prosodic processes on each syllable as he comes to it; or perhaps he first scans the word rhythmically, deleting *e*'s from C_1e/C_2 syllables, and then goes back to the beginning, scanning the word again and performing prosodic processes on each syllable as he pronounces it. I shall here show how it is possible to reformulate the rules for GCY prosody in an integrated way which requires only two scannings of the word, the first to rhythmically delete *e*'s from C_1e/C_2 syllables and the second to accomplish all other prosodic processes. This reformulation will *ipso facto* provide a single-scan method of treating prosody for NSU and SY, which lack the rule of prosodic *e*-deletion from C_1e/C_2 syllables. I shall then give a second reformulation of the GCY prosody rules which requires only a single scanning of the word to perform all prosodic modifications. This second reformulation is quite complex, as it in essence hinges on assigning stress in accordance with what the word will be like after *e*'s have been rhythmically deleted from C_1e/C_2 syllables one or two syllables ahead of the one in question. Its very complexity argues against it, suggesting that a strictly linear approach to prosody, which *a priori* might be considered an ideal representation, is not the preferable approach after all.

4.1. Two-scan reformulation

In the following two-scan reformulation of GCY stress, rule I is the same as our old rule 1, and rule II is a cycle to be applied to each syllable or pair of syllables in the word, starting at the

[28] Word-final *q* is realized as [χ] in NUN, and word-final *k* as [x].

beginning of the word after rule I has been applied all through the word.

I. Prosodic *e*-deletion
The *e* of a C_1e/C_2 syllable which is the second in a series of adjacent light open syllables is deleted.

II. Cyclic stress rules, letting X be the initial syllable of the word or the syllable following the last previously stressed syllable, X + 1 the syllable after X.
1) X is stressed if non-word-final and,
a) X is word-initial and closed, or
b) X is heavy, or
c) X is closed and X + 1 is open, non-final, and not followed by the final enclitic, or
d) X + 1 is heavy
2) If X is stressed because X + 1 is heavy, then X is closed by gemination
3) If X is stressed by 1), repeat cycle on next syllable; if X is not stressed by 1), then X + 1 is stressed if non-final
4) If X + 1 is stressed by 3) and is open, light, and full-voweled, then that vowel is lengthened, while if it is open and light with the vowel *e*, then the syllable is closed by gemination; in any case, repeat cycle on next syllable

One can see that this is equivalent to the earlier formulation by noting that 1a), 1b), and 1c) assign "inherent stress," 1d) assigns "secondary stress," 2) assigns "automatic gemination triggered by a following heavy syllable," 3) assigns "rhythmic stress," and 4) assigns "rhythmic length" and "automatic gemination triggered by a stressed, open, non-C_1e/C_2 syllable with the vowel *e*." The ordering has been changed here so that the rules can be applied cyclically rather than in "layers."

Let us examine how the old rules and the new rules treat the words *qayaqaa* [qayá·qa·] 'it is his kayak' and *angyaqaa* [áŋyáq·a·] 'it is his boat'. According to the old rules, the second syllable *-ya- in qayaqaa* receives rhythmic stress and therefore rhythmic length, and since it is stressed, automatic gemination of the *q* following it is blocked, even though that *q* is the initial vowel of a heavy syllable; secondary stress on *-ya-* from that heavy syllable is redundant. According to the new rules, the first syllable *-qa-* in *qayaqaa* is not stressed by 1), so the second syllable *-ya-* is stressed by 3) and lengthened by 4); the cycle starts again on the following syllable *-qaa*, but that is not stressed because it is word-final. Turning to our other example, according to the old rules the first syllable *ang-* in *angyaqaa* has inherent stress; there is no rhythmic stress, and *q* is automatically geminated as the initial consonant of a heavy syllable preceded by an unstressed open light syllable; lastly, the syllable *-ya-* gets secondary stress because it is followed by a heavy syllable. According to the new rules, the first syllable *ang-* in *angyaqaa* gets stress by 1a) because it is initial and closed; the cycle starts again with the second syllable *-ya-*, which receives stress by 1d) because it is followed by a heavy syllable, and, stress having been assigned for this reason, the *q* is geminated by rule 2); the cycle starts again on *-qaa*, not stressed because word-final.

To summarize, in both the old and new rules, rhythmic stress on a light open syllable triggers one result (lengthening of a full vowel, closure after *e*), while stress on a light open syllable preceding a heavy syllable triggers another (syllable closure). Rhythmic stress and its consequences have precedence over stress (secondary) preceding a heavy syllable. In the old formulation, automatic gemination precedes secondary stress, while in the new formulation, such gemination is triggered by secondary stress.

The two formulations are fully equivalent, and clearly one is not to be valued more than the other.

4.2. Single-scan reformulation

I shall here attempt to integrate rule I, prosodic *e*-deletion, with rule II to achieve a single-scan (strictly linear) prosody formulation.

An integrated single-scan formulation must correctly assign stress in the following cases of prosodic *e*-deletion.[29] (The formulations previously presented do this by reassigning stress anew after *e*-deletion.)

Example A: underlying *atepik* [atə́pik] becomes *atpik* [átpik] 'real name' (ICSS on *at-*)

Example B: underlying *qanrutekaqa* [qán˧utə́kaqa] becomes *qanrutkaqa* [qán˧útkaqa] 'I talk about it' (regressive stress on *-rut-*)

Example C: underlying *qanrutekaa* [qán˧utə́ka·] becomes *qanrutkaa* [qán˧útka·] 'he talks about it' (secondary stress on *-rut-*)

Example D: underlying *qanrutekagka* [qán˧utə́kaxka] becomes *qanrutkagka* [qán˧utkáxka] 'I talk about them[2]' (rhythmic stress on *-kag-*)

Example E: underlying *quuyurnitekagka* [qú·yú˧nitə́kaxka] becomes *quuyurnitkagka* [qú·yu˧nítkaxka] 'I smile at them[2]' (no stress on *-yur-*, rhythmic stress on *-nit-*)

Suitable cyclic stress rules will be as follows, letting X be the initial syllable of the word or the syllable following the last previously stressed syllable, X–1 the syllable before X, X + 1 the syllable after X, X + 2 the syllable after X + 1. (I have marked with { } clauses new to this formulation.)

1) X is stressed if non-word-final and,
   a) X is word-initial and closed, or
   b) X is heavy, or
   c) X is closed and X + 1 is open, non-final, and not followed by the final enclitic {and X + 2 is not a C_1e/C_2 syllable}, or
   d) X + 1 is heavy, or
   {e) X is open and light, X + 1 is a C_1e/C_2 syllable, and either X is word-initial, or X + 2 is open, non-final, and light, or X + 2 is heavy, or X–1 is unstressed}
2) If X is stressed because X + 1 is heavy, then X is closed by gemination, {while if X is stressed because X + 1 is a C_1e/C_2 syllable, then the *e* of X + 1 is deleted}
3) If X is stressed by 1), repeat cycle on next syllable; if X is not stressed by 1), then X + 1 is stressed if non-final
4) If X + 1 is stressed by 3) and is open, light, and full-voweled, then that vowel is lengthened; while if it is open and light with the vowel *e*, then the syllable is closed by gemination {if it is not a C_1e/C_2 syllable, but if it is a C_1e/C_2 syllable, then its vowel *e* is deleted and X + 2 is stressed}; in any case, repeat cycle on next syllable.

The clause marked with { } in 1c) serves to prevent regressive stress from falling on *-yur-* in Example E, in anticipation, so to speak, of *-ni-* becoming the closed syllable *-nit-* once *e* is deleted. {1e)} stresses the syllable before an *e* which will be deleted if this syllable is word-initial, as in Example A, or if the *e* is followed by an open light syllable, as in Example B, or if the *e* is followed by a heavy syllable, as in Example C, or if the syllable in question is preceded by an unstressed syllable, as in Example E (where the syllable is unstressed according to the new clause

[29] See section 5.

of 1c), as we have just seen). In effect, 1e) assigns inherent stress in anticipation of *e*-deletion. The clause marked by { } in 2) deletes *e* when appropriate and stresses the following syllable as in Example D.

Thus we see that it is possible to view C_1e/C_2 syllables as an integrated part of a single-scan prosody system. Both the single-scan and double-scan systems, as well as the "layered" (repeated) system, adequately describe GCY prosody. The single-scan system, however, seems too complex, compelling us to go back to the other two systems which are essentially equivalent, as has been shown.

5. Discussion of a variant CY stress pattern

Osahito Miyaoka, in his paper "Accentuation in Central Alaskan Yupik" (this volume, section 5.2.4), has reported that some Yupik speakers have a different pattern in regard to prosodic *e*-deletion. In this pattern, the stress assignment in a word is not always the same as if the deleted *e* had never been there. Instead, here, up to the syllable (S_1) before the syllable (S_2) before C_1e/C_2 (S_3), stress assignment takes into account the underlying *e* of S_3, and S_2 is invariably stressed. Stress assignment proceeds from there on as if the *e* had never been there. In particular, Examples D and E (from Section 4.2) would be stressed differently. In Example D, underlying *qanrutekagka* [qán˛utə́kaxka] 'I talk about them [2]' would become *qanrutkagka* [qán˛útkaxka] according to this pattern, rather than the usual *qanrutkagka* [qán˛utkáxka]. In Example E, underlying *quuyurnitekagka* [qú·yú˛nitə́kaxka] 'I smile at them [2]' (with retractive stress on *-yur-*) would become *quuyurnitkagka* [qú·yú˛nítkaxka] rather than the usual *quuyurnitkagka* [qú·yu˛nítkaxka]. For the speakers who follow this different pattern, prosodic *e*-deletion occurs at the same time as rhythmic stress is assigned (see discussion in section 3.6). The GCY stress rules in section 3.5 can be made to fit this pattern by eliminating rule 1) and adding a clause to rule 3) saying, "*e* of a C_1e/C_2 syllable is deleted and the preceding syllable stressed." For this pattern, the two-scan reformulation of stress rules in section 4.1 can easily be changed to a single-scan reformulation by eliminating rule I and changing rule II.4 to read, "If X + 1 is stressed by 3) and is open, light, and full-voweled, then that vowel is lengthened, while if it is open and light with the vowel *e*, then *e* is deleted (unless flanked by like consonants, in which case the syllable is closed by gemination); in any case, repeat cycle on next syllable."

Recent research shows that this variant pattern is prevalent in the Yukon, upper Kuskokwim (upriver of Aniak), and Nushagak river regions, while the pattern described in this paper is prevalent in the lower Kuskokwim River, Bristol Bay, Nelson Island, Nunivak Island, and Hooper Bay-Chevak regions, including those areas of coast and tundra between the Kuskokwim River and Nelson Island. From this distribution it appears that the pattern described by Miyaoka is probably the original Yupik pattern and the pattern described in this paper is a modification of that pattern, as indeed both are a modification of the NSU pattern where prosodic *e*-deletion does not occur.

SUPPLEMENTARY NOTES ON CENTRAL SIBERIAN YUPIK PROSODY

Michael Krauss

Nearly ten years ago I published a fairly comprehensive description of the surface phonology of Central Siberian Yupik (St. Lawrence Island and Chaplinski), including an account of word-level prosody (Krauss 1975:54-59). This account need not be repeated here, being recapitulated especially by Jacobson elsewhere in this volume. However, a number of additional points of interest concerning St. Lawrence Island and Chaplinski prosody have subsequently come to light. These are reported here.

1a. Loss of overlong distinction

Regarding the overlong vowel, I had written in 1975:56 that I had "strong reasons for suspecting that many of the younger generation, especially in Savoonga, make this distinction only optionally in practice." This statement is not only confirmed, but might be considered an understatement of that development, perhaps even for 1975. Currently, among the younger generations of speakers in Savoonga (now into middle age), and among the younger generations in Gambell (at least to age 20), there is widespread loss of that distinction, between lengthened short vowels and lengthened long (overlong) vowels in open stressed syllables. Thus, for speakers in those categories, pairs such as *ighsaquq* 'heart' and *'ighsaaquq* 'he refuses' ([iɣsá·quq] and [iɣsâ:quq]), *qayani* 'in kayaks' and *qayaani* 'in his own kayak' ([qayá·ni] and [qayâ:ni]), or even more in non-pair forms, such as *ataasiq* 'one' and *savika* 'my knife', the two lengths of stressed vowel in open syllables are no longer distinguished. A survey of the extent of this loss would certainly be in order for both sociolinguistic and practical interest. Recommendations might be made to retain the distinction in the orthography, at least where morphologically recoverable, on that basis and/or by reference to the speech of elders or written standards, but increased (orthographic) indecision is to be expected.

1b. Partial loss of vowel length distinction in Chaplinski

A younger speaker (fluent, mid-twenties) of Chaplinski in the Soviet Union was clearly noted to have lost distinctively overlong vowels, as have the younger generations on St. Lawrence Island. In addition to that, however, this speaker had also lost the distinction between long and short vowels in final syllables, at least where closed, after a stressed vowel, in polysyllables, thus e.g. *tamaghhaan* 'all of it' [tamá·ɣa·n] $\geqq$ [tamá·ɣan], and thus, for example, presumably, would also be the case for *qalqasiit* 'their navels' [qałqá·si·t] $\geqq$ [qałqá·sit] *qalqasit* 'navels'. It remains to be determined whether this loss of final syllable length distinction has spread also to open final syllables, or to final syllables after unstressed penultima (e.g. *avaqutaat* 'their offspring' [avá·quta·t] $\geqq$? [avá·qutat] *avaqutat* 'offspring (pl.)', and also to what extent this loss of vowel length distinction (and of the overlength distinction as well) has taken place in the Soviet Eskimo communities. Note furthermore, for instance, the possibility mentioned in my paper on Sirenikski and Naukanski prosody in this volume, that the overlength distinction may well be lost in Naukanski.

2. Hierarchy in word-level metrical foot structure

In addition to the disyllabic foot pattern implied by the basic Yupik alternating stress pattern in Central Siberian Yupik, the question arises as to whether there is a higher level pattern within the prosody of the word. Evidence for this is negative. Thus *akisimangisimakanga* 'he didn't have an answer for it' [akí·simá·ŋisí·maká·ŋa] does not itself show any consistent further contour such as [akí·simá·ŋisí·maká·ŋa], to imply another level of branching, or left- or right-branching pattern implied by consistent increase of stress to peak toward the end of the word, or decrease from a peak on the first stress. Whatever patterns there may be in degree of stress within the word are evidently determined at a level higher than the word itself, as expressed by Mrs. Badten, who, when I proposed such contours to her, found them acceptable, and aptly termed them a matter of "circumstance" and "emotion."

3a. Monosyllables with enclitics

Whereas no peculiarities have been noted in the joining of enclitics to disyllables or polysyllables in Central Siberian Yupik (unlike the case in Central Alaskan Yupik), or in the prosody of monosyllabic open stems with suffixation (again unlike the case in CAY), interesting peculiarities have been noted in the joining of enclitics directly to (short-vowelled) monosyllables in CSY. These have been tested with two speakers from Gambell, Adelinda Womkon Badten (AWB) and her niece, Vera Oovi Kaneshiro (VOK).

For *ma* 'voice' (pl. *met*) plus *-llu* 'also', both speakers preferred the form [má^{h}ɬu], definitely not homophonous with [maɬu] 'cadaver'. (The phonetics here, [á^{h}], are those of word final as in *tuma whaa* 'a footprint here' [tumá^{h}x^{w}a·], for which see below and 3b.) Likewise *na-llu* 'a place also' [ná^{h}ɬu] (VOK, not *[naɬu], and not [ná·ɬu] *naallu* 'a mother also', either). I here represent this special juncture orthographically with hyphen. That this peculiarity is not a property of the underlying vowel /ə/ (*e*) is clear from *tumallu* 'a footprint also' (underlying /tumə + ɬu]) [tumá·ɬu] (VOK, AWB; not e.g. *[tumə́ɬu] or *[tumá^{h}ɬu], but rather prosodically identical with *nunallu* 'land also' [nuná·ɬu] ← /nuna + ɬu/ and *nunami* 'on land' [nuná·mi]. That it is not a property of the underlying /ə/ is equally clear from the following examples with other vowels, *sa-llu* 'something also' [sá^{h}ɬu] (VOK), underlying /a/, *pi-llu* 'a thing also' [pí^{h}ɬu] (VOK). This is evidently not a property of the enclitic *-llu* alone either, as shown by *ma-wha* 'a voice maybe' [má^{h}x^{w}a] (AWB), *pi-tuq* 'something, I wish' [pí^{h}tuq] (AWB).

When the short monosyllabic stem is closed, e.g. as in *nek(-l)lu* '(two) places also', *net(-l)lu* 'places also', *sat(-l)lu* 'things also', the result [nə́kɬu], [nə́tɬu], [sátɬu] may be at a phonetic level indistinguishable prosodically from ordinary disyllables, as *aflu* 'span' [aɬu], *nenglu* 'underground house' [nəŋlu] pronounced in isolation, but there is, at any rate, an underlying prosodic difference still potentially realizable in construction with other words. For these disyllables, see 3b. below.

The peculiarity of distinctively stressed short initial syllable may persist in polysyllables, as further enclitics are added, especially for Mrs. Kaneshiro, as in *ma-lluqun* 'a voice also, remember?' [má^{h}ɬuqun], *pi-lluqunllu* 'a thing also, remember too?' [pí^{h}ɬuqúnɬu], but even for Mrs. Kaneshiro, at least if the stem-syllable is closed, there is a "more modern" option, as in *netluqun* 'places also, remember?' [nətɬú·qun], *pikluqunllu* '(two) things also, remember too?' [pikɬú·qunɬu], as well as the "more conservative" [nə́tɬuqun], [píkɬuqúnɬu]. For Mrs. Badten, however, the deuterotonic variants are very much the preferred ones, e.g. [pikɬú·qunɬu] preferably, and [píkɬuqúnɬu] only reluctantly; with open stems also, *melluwha* [məɬú·x^{w}a] and *melluqunllu* [məɬú·qunɬu] are also very much preferred to [má^{h}ɬuqúnɬu]. In fact, as implied here already, Mrs. Badten's treatment of the stem itself is more variable. Forms such as *ma-llu* [má^{h}ɬu] are unstable, for which to her *mellu* [məɬu] or *maallu* [ma·ɬu] are also acceptable variants.

The joining of enclitics directly to monosyllabic stems is evidently problematic for these speakers, at an interesting margin of phonological grammaticality, no doubt worthy of wider investigation.

The motivation for this peculiarity, moreover, is not entirely clear. It is most likely a vestige of the stem-stress principle, no longer functioning in CSY (except through lengthening of initial syllable vowel, not done here, except in one of Mrs. Badten's variants). This principle is also not otherwise applied in CSY to these open monosyllabic stems where suffixed, as e.g. in *menguulghii* 'it was a voice' [məŋú·lɣi·], *mekallu* 'my voice also' [məká·ɬu], *nemillu* 'in a place also' [nəmí·ɬu], where the stress has moved off the stem entirely, onto a suffix. Here alone, in these monosyllables with enclitic, a phonological distinction is maintained, at least as an option for some speakers, between enclitic and suffix, in resistance to moving stress off a stem directly onto an enclitic (though not onto a suffix).

3b. Final syllable and prosodic demarcation of the word

Stress, manifested as distinctively higher energy, higher pitch, and lengthening of vowels in open syllables, never occurs on the final syllable of a word. This obviously "natural" trait also serves a demarcative function, marking the end of the word.

It is not clear whether this is best viewed as deletion of stress after that is assigned by general rule, or whether the stress-assignment rule is limited so that final syllables never receive stress in the first place. Conceivably an answer might be found in Soviet Chaplinski where loss of distinctive vowel length in final syllables is taking place after stressed penult ([tamá·ɣa·n] ≧ [tamá·ɣan]), in that if the distinction is preserved in final syllables after unstressed penult, e.g. *avaqutaat* ≠ *avaqutat* ([avá·quta·t] ≠ [avá·qutat]), then there would be some indication that alternate syllable stress had been assigned to the ultima at some point, thus preserving the length distinction, whereas that is lost in the ultima to which alternate stress could not be assigned at any point.

However it is considered to be derived, the lack of stress on final syllables also creates some interesting problems in the case of monosyllables and disyllables, since presumably in some sense every word has at least potentially one stress. In monosyllables, evidently, it might be said that there is no ultima, allowing the monosyllable to be stressed, long or even short, as seen in the very special case of immediately added enclitics, as especially in [píkɬuqúnɬu], otherwise an impossibility unless two words.

Disyllables, however, which can hardly be construed to lack an ultima, present another problem. Unless the first syllable is long and therefore stressed, disyllables would also be entirely stressless by the rule of stressless ultima. In such cases, e.g. *nuna* 'land', *aghnaq* 'woman', though the vowel length in both syllables is maintained as equal, in isolation there is a tonal contour [núnà], [áɣnàq], with higher tone on the first syllable, lower on the second. This same contour is perhaps even more notable or striking where the ultima has a long vowel, as in *amaa* 'wolf' [ámà·].[1]

At a superficial level the high tone marks in these disyllables might be considered equivalent to stress, in that *sat-llu* 'things also' [sátɬù] appears to be prosodically identical with *aflu* 'span' [áflù] (though *ma-llu* 'a voice also' [má^{h}ɬù] manages to be different from *mallu* 'cadaver' [málù]). At any other level, however, they are ("conservatively") quite different, [sátɬuqun] vs. [aflú·qun].

Furthermore, the tonal contour of ordinary disyllables, [´`] in isolation, proves to be different, [`´], in construction (limiting ourselves to very simple construction here, and without going into the problems of higher level prosody): thus *aghnaq una* 'that woman' [àɣnáq ùnà], *nuna una* 'that land' [nùná ùnà] (with optional slight glottal break, either [^{h}] or [^{ʔ}]; definitely not *[nùná· ùnà] or *'[nunâ:na]); likewise *amaat ukut* 'those wolves' [àmá·t ùkùt] (not now *[ámà·t ùkùt], but not

[1] It is perhaps for this reason that Menovshchikov at one point transcribes this *áma* (1983:9,26; cf. note 7 to "A History of the Study of Yupik Prosody," this volume). That transcription thus would suggest similar phonetics on the Chaplinski side.

Note also that the falling tone contour characteristic of overlong vowels in stressed open position, as in e.g. *amaant* 'in wolves' [amâ:ni], is definitely absent here, [ámà·], with long flat low tone on ultima, not *[ámâ·], with any high pitch in the ultima. This advises strongly against stress placement by mora counting, which otherwise would allow *[ámàà]; thus in no way is *aa* to be considered disyllabic.

*[àmâ:t ùkùt] either). With monosyllable plus enclitic, however, even for Mrs. Badten, in *nek(-l)lu ukuk* 'those two places also', though [nə̀klú ùkùk] is much the preferable variant, [nə́klù ùkùk] is acceptable, confirming the potential underlying special distinctive stress on the monosyllabic stem.

The tonal contour with high on the ultima is limited, however, to disyllables, thus *avaqutaq una* 'that offspring' [àvá·qùtàq ùnà] (not *[àvá·qùtáq ùnà]). Except for the disyllables, then, pitch on the ultima must remain low.

Finally, further prosodic definition of the word is interestingly manifest in connection with sandhi rules which operate in connected speech to prevent, by means of dissimilation or deletion, the sequence of two identical consonants even across word boundary, in keeping with the complete avoidance of such sequences or geminates also word-internally in CSY. Thus e.g. *naghuyat tallimat* 'five seagulls' → *naghuyas tallimat* [naɣú·yastałí·mat], *naghuyam maniga* 'the seagull's egg' → [naɣú·yamaní·ɣa], and *aghnam maniga* 'the woman's egg' [aɣnámaní·ɣa]. The concrete segmental sandhi rules operate after the prosodic ones, thus also not *'[naɣú·yastá·łimat], *'[naɣú·yamá·niɣa], or *'[aɣná·maní·ɣa]; conversely, in *avaqutat tallimat* 'five offspring', and *avaqutiit tallimat* 'their five offspring' → [avá·qutastałí·mat], [avá·quti·stałí·mat], the ultima remains unstressed and without rise in pitch, creating sequences of three unstressed syllables, [-qutasta-], not *[-qutásta-], in spite of the pervasive alternate syllable stress rule, and even sequences of three unstressed syllables with a long vowel in the middle syllable, [-quti·sta-], not *[-qutí·sta-], in spite also of the basic long vowel stress rule, while at the same time consonantal sandhi (here [-t t-] → [-st-]) is operating, to link the words segmentally. Thus word boundary is seen to be more inviolate and more strongly defined prosodically than segmentally.

ACCENTUATION IN CENTRAL ALASKAN YUPIK

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1. Introduction

1.1. Historical background[1]

The prosodic system in Central Alaskan Yupik (CY), an Eskimo language spoken in southwestern Alaska, has by now been well explored, together with its minor dialectal variations, and a basically adequate understanding of the system has been arrived at. As early as 1952 Morris Swadesh published the basic observations that "whenever a consonant located after the first morpho-phonemic vowel of the word comes to be followed by a morpho-phonemic vowel group, *the consonant is doubled*," and that "in the possessive paradigm of bi-syllabic nouns and some other formations, *doubling of the vowel* of the second syllable takes place under certain circumstances" (1952:33,34; emphasis mine). The quantitative changes, consonant gemination and vowel lengthening, of the type Swadesh mentions here are in fact not limited to specific positions in a word or to morphological classes. Miyaoka (1970) clarified that, instead, gemination and lengthening occur respectively in any environment of $\breve{V}$__VV and $\breve{V}$C__CV (where $\breve{V}$ means a weak syllable) and also noted that rhythmicity is responsible for pre-enclitic vowel lengthening. Interrelatedness between the two kinds of quantitative changes was formulated in Miyaoka (1971) in terms of "syllable modification" or "conspiracy against a certain type of syllable sequence."

Jørgen Rischel provided fresh insight into the CY prosodic system when he wrote, "Strengthening is manifested as vowel lengthening if the vowel is followed by a consonant, but if it is followed by a vowel the lengthening is *transferred* to the preceding consonant" (1974:85, emphasis mine). The idea of "transfer," which corresponds to "regression" in recent formulations of CY prosodic rules, is a very significant one. Explanation of some of the prosodic processes was more recently attempted by Jeff Leer in his most important historico-comparative study (1977) of stress in the Yupik languages and Seward Peninsula Inupiaq. It is to Steven Jacobson (1984) and Anthony Woodbury (1981a) in particular that we owe a great deal of accurate documentation of dialectal variations of the prosodic system within CY.[2]

[1]I wish to express my heartfelt gratitude to many Yupik speakers who have helped me for varying periods of time in understanding the language. Above all, Elsie Mather has helped me invaluably with her keen linguistic insights and sophistication. Information from various dialects cited in this paper I owe particularly to Paschal Afcan (Yukon dialect), Marie Blanchett (Kuskokwim), Showalter J. Smith (Nunivak), Martha Teeluk (Norton Sound), and Sheldon Nagaruk (Norton Sound). I am deeply indebted to Knut Bergsland (Oslo), Jørgen Rischel (Copenhagen), and Pekka Sammallahti (Oulu) for helpful comments, to Anthony Woodbury (Austin) and Steven Jacobson (Fairbanks) for detailed suggestions and information concerning the CY dialects, and to Michael Krauss (Fairbanks) for his guidance and stimulation in my Yupik study. My research leading to this work was partly supported by the University of Alaska's Yup'ik Language Center (Bethel) from 1977 to 1981, and by the Japanese Ministry of Education (Grants in Aid for Scientific Research, 1980). For references throughout, see list at the end of this volume.

[2]There is also published a paper on CY prosody by Jang H. Koo (Vowel Lengthening in Yuk Eskimo, *Linguistic Journal of Korea*, 1(1):84-88, 1976), but this, which adds nothing of interest to our knowledge of the subject, grossly misunderstands and distorts information given in Miyaoka (1970) and in an early prepublication copy of Reed et al. (1977).

Two alternative formulations of the prosodic rules are presented in Reed et al. (1977) to describe the system. One formulation assigns rhythmic vowel lengthening and automatic consonant gemination first and stress second (1977:11-15), while the other formulation, given as an addendum to the book, assigns stress first and lengthening and gemination second (1977:312-313). Jacobson (1984:9-10) adopts the basically same formulations as the latter, though in a slightly modified form. These formulations are descriptively adequate in fact, but they apparently fail to elucidate the underlying principle which governs the whole prosodic system with its various phonetic processes.

Another formulation, considerably simpler than the two above, is proposed in Miyaoka and Mather (1978:138-144). This one is characterized by a different view of the syllable in CY from Reed et al. (1977) and Jacobson (1984), as will be seen in section 2.2, and by a recognition that the quantitative changes and the stress should not be considered separately but merely as two faces of the same coin (cf. 3.2 below).

1.2. Purpose

The prosodic system in CY has its phonetic realizations in quantitative changes, i.e. (consonant) gemination and (vowel) lengthening, as well as stress and tone. A geminated consonant is phonetically ambisyllabic, while a lengthened vowel is tautosyllabic. The pattern of the operation of the system is basically rhythmic. The rhythmic pattern may, however, be disturbed by a number of factors, which include at least the following: (1) expressiveness (such as emphasis and affective value) specific to certain lexical items,[1] (2) accent inherent in certain lexical items,[2] (3) syllable contraction in some lexical items which have certain segmental sequences,[3] (4) monosyllabic bases,[4] and (5) foot structuring.

The first three of these disturbing factors are lexically conditioned, while the last two, which are not unrelated to each other, are phonologically predictable. The disturbing factor of the widest scope is (5). Thus, apart from the disturbances due to (1) through (3), the prosodic system of CY is describable in relation to syllable sequence and boundary. This does not necessarily mean, however, that it can be adequately explained in such terms alone. The syllable sequence which constitutes a phonological word needs to be viewed as a sequence of rhythmic feet. The relevance of feet to the rhythmic pattern is quite natural and obvious. Its significance or explanatory force goes far beyond that, however. The mechanical, i.e. automatic, disturbance of (5) is related to a preference in foot structuring, avoidance of certain types of feet in favor of others, which is in turn conditioned (i) by "accentual capacity" of syllables or "syllable strength" to bear the weight of accent, and (ii) by the need for boundary signaling.

One of the features which characterize the prosody of CY as contrasted with, say, Central Siberian Yupik (Chaplinski and St. Lawrence Island) is consonant gemination. Various causes have been identified for development of gemination in many languages of the world. Apart from expressive gemination, the more common reported instances of gemination which are of a mechanical nature are due to assimilation of two originally different consonants, juxtaposition of two identical or secondarily assimilated consonants as a result of syncopation of originally intervening material,

[1] E.g. *assiq'apigtuq* [asiqqapixtuq] 'it is *very* good' (cf. *assiqapigtuq* [asi·qapixtuq] 'it is very good').

[2] E.g. *ak'a* [akka] 'already', *mav'uqertuq* [mayyuqəxtuq] 'he is going up suddenly' from the base *mayur-* (vs. *mavuqertuq* [mayu·qəxtuq] 'he is going up a while'). The postbase *-qert-* 'suddenly, fast' causes the accent to regress. See also *at'ullagtuq* [attułaxtuq] 'he suddenly sings' from the base *atur-* (vs. *atullagtuq* [atu·łaxtuq] 'he sings imitatively, sings after someone else does'), and *ᾱqaq'allagtuq* [waqqałaxtuq] 'he retches, gags suddenly' from the base *ᾱqaqaur-* (vs. *ᾱqaqaallagtuq* [waqqaałaxtuq] 'he retches imitatively'); note that in the second example the regression is accompanied by contraction of *aa* into *a* so as to make the syllable preceding the postbase unaccentuated.

[3] E.g. *mertu'rtuq* [məxtúxtuq] 'he is keeping on drinking' with the contraction of *rar* (cf. *merturtuq* [məxtuxtuq] 'he is drinking (water)'). See fn. 11 also, and the relevant section of Jacobson, this volume.

[4] E.g. *Yup'ik* [yuppik] 'genuine person, Eskimo' with the base *yug-*, *mic'uqtuq* [miccuxtuq] 'it wants to land' with the base *mit-*. See Jacobson (1984:10) for another type of disturbance specific to monosyllabic "empty" base.

or compensation for deletion of neighboring material. None of these, however, is the case with CY "automatic" gemination. It will be seen that this gemination in CY may most adequately be understood only by viewing the prosodic pattern as a foot-structuring process.

In the present paper, after phonological preliminaries are covered, an attempt is made to elucidate the general and automatic prosodic pattern of the language in terms of an underlying principle, viz. foot structuring: non-automatic prosodic phenomena relevant to factors (1) through (3) and the phenomenon specific to (4) are not treated herein (but partly by Woodbury 1981b and by Jacobson in this volume). To cover all the phonetic realizations of the prosodic pattern, the term "accent" is employed here for lack of a better general term, although its use has recently become less popular than formerly, in part because of its possible ambiguity. It is understood here that quantitative changes, stress, and tone all contribute as effective cues to the prominence of an accentuated syllable.

2. Phonetic groups: phonological unit, syllable, and foot

2.1. Phonological unit as prosodic domain

In CY, which is a polysynthetic language, a word as a morphological unit defined by potential pause as well as by morphological characteristics is predominantly polysyllabic, although there are a small number of monosyllabic words, mostly enclitics. An enclitic word, which by definition does not occur by itself but is phonetically appended to a preceding word, forms together with it an independent "phonological unit" which is bounded by pauses and is unified by the accent pattern. More than one enclitic may be attached. It also happens in utterances that two or more non-enclitic words in syntactically close connection (such as a junctional or appositive nominal phrase) constitute an independent phonological unit.

Thus an independent phonological unit, primarily characterized by pause, can either be a single non-enclitic word or a single non-enclitic word followed by one or more (enclitic or non-enclitic) words. Relevance of accent as the unifying feature of a phonological unit will be clarified in this paper. (Syntactical relevance which a phonological unit may have is beyond the scope of this paper.)

A phonological unit which consists of a non-enclitic word followed by an enclitic constitutes a tighter phonological unit than one which consists of two non-enclitic words. The three different boundaries, i.e., of a phonological unit, a non-enclitic word, and an enclitic, have their respective phonological features distinct from one another.

2.2. Syllables: phonological and phonetic

In CY a full vowel *(a, i, u)* can occur single or double and can cluster with another full vowel, but the fourth vowel *e* [ə] (non-front, non-back, non-low) cannot cluster with a vowel (or occur double). Also, the vowel *e* does not occur as such at the end of a word because of the word-final adjustment whereby *e* becomes *a* (except that *te*→*n*/V__#). Any consonant can occur single or as a geminate and can cluster with another consonant. Consonant clusters or geminates do not occur at the beginning or end of a word.

A syllable, which is a carrier of accent, is the minimum prosodic unit. At the *phonological* or underlying level, syllables in CY are either open, (C)V, or closed, (C)VC. Syllable division, marked by period (.), comes (i) between two vowels (VV→V.V), (ii) between two consonants (CC→C.C), and (iii) before a single intervocalic consonant (VCV→V.CV). A geminate consonant, which is ambisyllabic, is an instance of (ii). The syllable division of (i) implies that a vowel cluster or a double vowel is regarded here as prosodically disyllabic, although *phonetically* it admittedly constitutes a single syllable. The syllable employed in Reed et al. (1977) is therefore of a phonetic nature, unlike that of this paper. I claim here, however, that the use of syllables at the phonological level is a better way to describe and explain the CY prosodic system adequately. A phonological syllable as such can then be equated with the so-called mora. The present writer has

consistently used the term syllable in this sense in treatments of CY prosody (Miyaoka 1970, 1971; Miyaoka and Mather 1978). The term "mora" is not used in the present paper either, but it is understood that CY is a "mora-counting" (rather than a "syllable-counting") language; see 5.2.1 below.

A syllable (whether open or closed) in CY is either strong (i.e., accented) or weak (i.e., unaccented) depending upon the environment in which it occurs. A closed syllable more easily bears accent weight or weight of a strong syllable than does an open one.[7] Accordingly, an open syllable tends to be weak, while a closed syllable tends to be strong. To this difference would reasonably be ascribed, for instance, the treatment of a word-initial syllable as reflected in Rule I (5.1). Also considered due to the greater accentual capacity of a closed syllable are, among others, the following facts, to be mentioned in advance: a single closed syllable can constitute by itself what is called a "foot" (2.3), but a single open syllable alone cannot (except for one very specific case, 6.5.2.2); and a closed syllable can be strong without any change in its segmental composition, while an open syllable needs quantitative change of a segment through (vowel) lengthening or (consonant) gemination when it becomes strong (3.2).

At the phonetic surface a (phonologically) single full vowel can occur lengthened and a (phonologically) single consonant can occur geminated. At the phonetic level as well as the phonological a syllable is either open or closed. A syllable nucleus, which may or may not be preceded and/or followed by a single consonant to constitute a syllable, has one of the following shapes: [V] (single short), [V·] (single long), [V_1V_1] (double), or [V_1V_2(·)] (cluster). As the second vowel of two successive identical vowels has its lengthening blocked due to the two-mora limitation in CY, [V_1V_1] and [V·] are identical in quantity. They can, however, differ in tone: the former can have a markedly rising tone, especially in a "prime-accented" syllable (3.1, below), while the latter has a level tone.[8] There is no "overlong" vowel with three morae in CY, a notable difference from Siberian Yupik (cf. Krauss 1975), in which three phonetic quantities of vowels (short, long, and overlong) may be correlated with the lack of consonant gemination. (The vowels as in *ii-i* 'yes' and *aa-ang* 'yes,' which have a hiatus at the boundary, are not to be called "over-long.") The (·) in [V_1V_2(·)] means that V_2 may be either short or long; it is short ("delengthened") in the case of a closing diphthong but tends to be kept long otherwise (e.g. [ai] vs. [ia·]).

As will be explained in 3.2, it is a full vowel of a rhythmically accentuated open syllable which is to be lengthened. There are, however, instances of a lengthened vowel in a closed syllable, the sources of which are mainly certain types of syllable contraction and particularly Russian loanwords.[9] This means that such a lengthened vowel contrasts at the phonetic surface with a single (non-lengthened) vowel in a closed syllable: [(C)VC] vs. [(C)V·C], each of which is again distinct from a double vowel [(C)VVC].[10] See 4, below, for the orthographical device for representing this surface contrast.

2.3. Foot

As will be clarified later, the CY accent system can be explained in large part with reference to the kind of syllables (open or closed) and their sequence in a phonological unit. The rhythmic nature of accents placed on a sequence of syllables was clearly demonstrated when the present writer

[7]There is evidently some difference among the dialects in this respect, see 5.2.

[8]Compare [ka·] vs. [kaa] in (i) [is/xatká·ʃu] 'also my grass basket' and (ii) [is/xát/kaa/ʃu] 'also it is his grass basket'. The former is from *issratka-llu* (Rule I,II, with IIIb blocked) and the latter from *issratkaa-llu* (I,II,IIIa,II). The variant [is/xat/kalu] for (i) used by some speakers is from *issrateka-llu* with accent-related *e* suppression (I,II,IIIc,II,IV); see 5.2.4.

[9]Syllable contraction notably of *rar* sequences: e.g. *ugi'irtuq* [uɣí·xtuq] 'it comes ashore suddenly' (from underlying *ugirartuq*). Examples of Russian loanwords concerned: *kela'askaq* [kəlá·skaq] 'paint' (from *kraska*), *pula'avkaaq* [pulá·ʃkaaq] 'safety pin' (from *bulavka*).

[10]Compare *ugirtuq* [uɣíxtuq] 'it comes ashore', *ugi'irtuq* [uɣí·xtuq] 'it comes ashore suddenly' (see fn. 9), and *ugirtuq* [aɣɣíxtuq] 'it is approaching'.

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employed (though he did not fully utilize) the unit of foot as the carrier of rhythmic accent in explaining what he then termed "secondary lengthening," which takes place on an open syllable immediately preceding an enclitic (Miyaoka 1970). We are now aware that it is not necessary to make the distinction between "primary" and "secondary" vowel lengthening (see 6.4); rather, one and the same rhythmic pattern operates not on a portion but on the whole of a word (apart from word-boundary peculiarities). However, this implies not only that the foot is relevant to rhythmic accentuation of a whole word but also that it is useful in explaining why accent is phonetically realized in a particular way, say, as gemination in some environments. It is nothing other than a preferential tendency (or a "surface constraint") in foot structuring which is responsible for the characteristic system of CY prosody: one may view the tendency as a "conspiracy against certain types of foot" (see 1.1). Furthermore, it is, among other things, difference in foot structuring that phonetically distinguishes various boundaries from one another. It now seems to me that the concept "foot" as well as the syllable is indispensable to an insightful explanation of the CY prosodic system.

Basically, a foot in CY is either disyllabic and iambic, consisting of a weak syllable followed by a strong syllable, or monosyllabic (except at the end of a phonological unit). The syllable in a monosyllabic foot, which naturally must be an accented one so that it may constitute a foot by itself, always turns out to be a closed syllable (except for one very specific case, see 6.5.2.2). It follows from this that a foot division, marked by slash (/), never fails to come immediately after a strong syllable. A trochaic foot (strong syllable followed by weak) does not occur in CY.

3. Accent

3.1. Rhythmic and regressive accent

Accent brings out contrast in prominence between successive syllables. A syllable with more prominence is accented (strong). One with less prominence is unaccented (weak). If a phonological unit has two or more accented syllables, the one closest to the end of the unit carries the greatest prominence. This is called "unit-final" accent.

A phonological unit in CY is accentuated by the rules proposed in 5 and 6. These apply iteratively, proceeding from left to right. Two kinds of accent *must* be distinguished: rhythmic (or "iambic") accent marked by acute accent (V́) and regressive accent marked by grave accent (V̀). Rhythmic accent, which is completely dependent on the syllabic structure of a word, operates progressively (i.e. rightward) from the beginning of the word to the end. The unidirectional operation of rhythmic accent, however, may be disturbed: information about a following portion of the word regressively affects the otherwise unidirectional accentuation. Regressive accent (i.e. leftward movement of accent) is not only dependent upon the syllabic structure of a word but is also conditioned by a word boundary or by specific marked lexical items (suffixes as well as bases). Rhythmic accentuation is primary, while regressive is secondary, in that the latter presupposes the former. Rhythmic accent is responsible for iambic feet, regressive generally for monosyllabic feet (except for those by Rule I, 5.1). The two kinds of accent are realized phonetically in the same way as far as stress and tone are concerned. The phonetic difference there is between them is in duration, to be explained in the next section.

3.2. Phonetic realizations of accent

Accent in CY is phonetically realized in changes in three distinct prosodic features: duration, intensity (stress), and pitch (tone). Although this needs confirmation by instrumental phonetic study, it appears that in CY all three play a part in increasing the contrast in prominence between syllables and in the perception of accent, with one or two features being more effective than the other(s) depending on the type of accented syllable. The three features are nothing but different phonetic realizations of a single prosodic phenomenon.

Change in duration may be either segmental or syllabic. The former, which is called "quantita-

tive change," takes the form of segment doubling, i.e., consonant gemination (which is ambisyllabic) or vowel lengthening (which is tautosyllabic). The latter is a "stretching" of a syllable as a whole and will be described in the next paragraph. A full vowel of a rhythmically accentuated open syllable is lengthened ((C)V́.CV(C)→[(C)V·CV(C)]), while a rhythmically accentuated open syllable with *e* or a regressively accentuated open syllable (with any vowel) becomes a closed syllable with the immediately following syllable-initial consonant becoming geminated (C*é*.CV(C)→[CəCCV(C)], (C)V̀.CV→[(C)VCCV]). Accent on a closed syllable is realized particularly in greater stress. An accented syllable either open or closed is also characterized by higher tone than an unaccented one. A unit-final accented syllable has the culmination of prominence with the longest duration, the greatest stress, and the highest tone. The tone of a phonological unit falls rapidly after the unit-final accented syllable. See 6.5 for specific realizations of "pre-boundary regressive accent."

Duration of a syllable is a product of accent and of the segmental structure of the syllable. Apart from a unit-final accented syllable, it appears that accented syllables of the same segmental structure tend to be approximately of equal duration wherever they occur in a phonological unit. This seems to be true of unaccented syllables as well. A consequence of this is that CY does not show those constant changes in syllable duration which are found, say, in English. Syllable duration does vary, however. A closed syllable has measurably longer duration in a monosyllabic foot than in a disyllabic one, a natural consequence of (approximate) isochronism of feet, as will be exemplified in 5.2.1 and 6.5.1.3. A monosyllabic foot, particularly a unit-medial one, is more or less "stretched" as a whole (i.e., the closed syllable is pronounced in slower tempo), although no segmental doubling is involved in the stretching. This is as if the foot were asserting its independent foot status between the two flanking feet.

Accent in CY is basically non-distinctive and largely phonologically predictable. However, as an outcome of non-automatic (e.g. lexically conditioned) disturbances, accent may carry distinctive function, though to a very limited extent.[11]

4. Segmental representation

Segmental representation at the underlying level is in the standard orthography currently used in the CY area (here in italics), while phonetic surface representations are in modified IPA in brackets. The beginning of an enclitic is marked with a hyphen, as in the standard orthography. The beginning of a non-enclitic boundary within a phonological unit is marked in this paper by = and the boundary of a phonological unit by space or by # at both ends.

The symbols used in the standard orthography are: *a, i, u, e* [ə]; *p, t, c, k, q; v, l, s, g* [ɣ], *r* [ɣ]; *w, y, m, n, ng* [ŋ]. Doubly written fricatives are voiceless (*vv* [f], *ll* [ɬ], *ss* [s], *gg* [x], *rr* [x̣]), not geminate. Single fricatives (*v, l, s, g, r*) are voiceless at the beginning or end of a word, next to a stop (*p, t, c, k, q*, all voiceless), or after a doubly written fricative, but otherwise voiced ([v], [l], [z], [ɣ], [ɣ]. The symbol *v* represents intervocalic [w] as well as [v] and [f]. The symbol *w* represents prevocalic [xʷ] (but [w] in Norton Sound dialect), while [ɣʷ], preconsonantal [xʷ], and word-initial [w] are represented by the digraph ûg. The symbols *m, n,* and *ng* represent nasals, voiced except after a voiceless consonant. A voiceless nasal which is not preceded by a voiceless consonant is represented here by a nasal with a macron over it (*m̄* [m̥], *n̄* [n̥], *ng̱* [ŋ̊]) (in Reed et al. 1977 and Jacobson 1984a, voiceless nasals are marked with an acute accent rather than a macron).

The use of the apostrophe (') in the orthography is multiple. Gemination which is not automatic is indicated by an apostrophe between the consonant and the following vowel: VC'V [VCCV]. An accent on a closed syllable which is not predictable from the orthographical level of representation is indicated by an apostrophe between the syllable nucleus and the following syllable-final conson-

[11] E.g. *angerturtuq* [aŋəɣ tuxtuq] 'he is chewing gum' vs. *angertu'rtuq* [aŋəɣ tux tuq] 'he keeps saying yes,' in the latter of which the accent on *tu* + *r* is connected with syllable contraction. See also fn. 5.

ant: V'CCV [VCCV]. Devoicing, which occurs on a fricative next to, or a nasal immediately preceded by, a voiceless consonant, is blocked when an apostrophe is put between the two consonants (C'C). A lengthened vowel which contrasts with a single (non-lengthened) vowel in closed syllables at the phonetic surface (see 2.2 and fn. 10) is represented by an apostrophe between two identical vowels (which otherwise indicate a double vowel): V'VC [V·C], cf. VVC [VVC]. This last use of the apostrophe for the surface contrast is an orthographical device necessitated by the fact that the representations of vowels in the orthography are primarily based on an underlying phonological level rather than a taxonomical surface. See Miyaoka and Mather (1978) for more details of the orthography, including other (non-prosodic) uses of apostrophe.

5. Rules of accentuation

5.1. Rhythmic accent (Rule I and Rule II)

A word-initial syllable is accentuated if it is closed (Rule I), e.g.

(1) *ang.ya.mi.ni* → *áng.ya.mi.ni* (Rule I)
'in his own boat.'

Accent falls rhythmically, i.e. iambically, on every second syllable (Rule II), e.g.

(1) *áng.ya.mi.ni* → *áng.ya.mí.ni* (Rule II) [áŋ.ya.mi·.ni].

Note that the full vowel *i* of the accentuated syllable *mi* is lengthened (3.2). This is what has often been called rhythmic lengthening (Reed et al. 1977:11).

(2) *qa.ya.mi.ni* → *qa.yá.mi.ni* (II) → *qa.yá.mi.ni* (IV) [qa.yá·.mi.ni]
'in his own kayak.'

Rule II accentuates the final syllable *ni* as well as the second syllable *ya*. But the *ni* is "deaccentuated" owing to a later rule (Rule IV, 5.3) which applies on the syllable immediately preceding a non-enclitic boundary (=) or a phonological unit boundary (#).

By the principle that a foot division immediately follows a strong syllable (2.3), the two words above are divided into feet thus:

(1) [áŋ/yamí·/ni]

(2) [qayá·/mini].

Rule I and the principle of foot division imply that a word-initial closed syllable always constitutes a monosyllabic foot as is the case with (1). The final residual syllable(s) without accent, such as *ni* in (1) and *mini* in (2), may be called a "hypermeter." A hypermeter as the result of rhythmic accentuation and deaccentuation consists of one or two (but not more) successive weak syllables immediately preceding the boundary # and preceded by a unit-final accented syllable (3.1).

It follows from the primarily rhythmic nature of accentuation that, if a word consists entirely of closed syllables, every odd-numbered syllable (apart from the word-final one) will be strong, e.g.,

(3) *qus.ngir.ngal.ngur.pag.tang.qerr.sug.nar.quq* →
qús.ngir.ngál.ngur.pág.tang.qérr.sug.nár.quq (I, II)
[qúz/ŋiɣŋál/ŋuχpáχ/taŋqəχ/suɣnáχ/quq]
'there seems to be a big goat.'

On the other hand, if a word consists entirely of open syllables, it follows that every even-numbered syllable (apart from the word-final one) will be strong, e.g.,

(4) *ma.qi.qa.ta.lli.ni.lu.ni* → *ma.qí.qa.ta.lli.ni.lu.ni* (II, IV)
[maqí·/qatà·/lini·/luni]
'(he) apparently being about to take a steambath.'

More often than not, however, a word is a mixed sequence of both kinds of syllables, as, for instance, the following:

(5) *qa.yar.pag.tang.qe.lli.ni.uq* → *qa.yár.pag.tàng.qe.lli.ni.uq* (II, IV)
[qayáx/paxtàŋ/qəlí·/niuq]
'(now I see) there is a big kayak.'

In this case, the rules apply just as in the preceding examples.

Rhythmic accentuation, however, is mechanically and lexically disturbed in many cases (1.2). Mechanical disturbance is particularly caused by preferential tendency (or surface constraint) in foot structuring, as will be seen in 5.2. Lexically conditioned disturbance (as exemplified in fn. 4) is outside the scope of this paper. Rule II is also blocked across a non-enclitic boundary (=), as will be seen in 6.2. This means that a word following the boundary is rhythmically accentuated anew starting from its own initial syllable. Prosodic peculiarities concerning a boundary (enclitic or non-enclitic) inside a phonological unit are to be discussed in 6.

5.2. Regressive accent (Rule III)

Two successive syllables of some types must cluster in a single foot, while those of other types must separate into two successive feet. Owing to this surface constraint in foot structuring, if rhythmic accent by Rule II is due to fall on a certain open syllable, the accent regresses onto the preceding syllable which, because of its environment, is primarily a weak syllable. The secondarily, i.e. regressively, accentuated syllable comes to constitute a monosyllabic foot by itself. The remaining portion of the word is again accentuated in iambic rhythm by Rule II. Accent regression is responsible for some of the word-initial and most of the medial monosyllabic feet. It takes place as shown in 5.2.1 through 5.2.3.

5.2.1.

Any two consecutive vowels (either a vowel cluster or a double vowel) within a word must cluster together in a single foot, avoiding a foot division between the two vowels. The close connection of two consecutive vowels manifests itself in that phonetically a vowel cluster or a double vowel is a single syllable, as mentioned in 2.2.

If rhythmic accent is due to fall on the first vowel of a vowel cluster or a double vowel, the accent regresses onto the preceding syllable (Rule IIIa), e.g.,

(6) *a.ki.a.ni* → *a.kí.a.ni* (II) → *à.ki.a.ni* (IIIa) → *à.ki.áni* (II) [àk/kiá·/ni]
'across it.'

Note that the word-initial open syllable *a*, which is primarily unaccented, is regressively accentuated and becomes closed with the first element of the geminate (3.2), so as to constitute a monosyllabic foot. This is what has often been called "automatic gemination" (Reed et al. 1977:13). The second *(ki)* and the third syllable *(a)* now constitute another foot, and the cluster *ia*, which is phonologically ambisyllabic, phonetically becomes a single syllable. If the word were subject only to rhythmic accentuation without being affected by any further change, it would phonetically

occur as *[akí·ani] with foot division between the two vowels. Such a form violates the surface constraint.

It is interesting to compare such a regressively accentuated syllable as [àk] in (6) with a rhythmically accentuated open syllable whose nucleus is a full vowel, e.g. [yá·] in (2) [qayá·/ni]. The former syllable [àk], becoming closed by gemination, constitutes a monosyllabic foot, while the latter [yá·], remaining open albeit with its vocalic quantity changed (by lengthening), can constitute a foot only together with another syllable which precedes it. This difference may be taken as a sure indication that consonantal quantity change (i.e. gemination)—a phonetic realization connected with accent regression—is a process by which the (regressively accentuated) syllable in question is so strengthened (through becoming closed) as to bear the weight of a monosyllabic foot. It should, then, be understood that gemination cannot be fully explained by the tautosyllabic, i.e. phonetic, interpretation of a vowel cluster and a double vowel. If the vowel cluster *ia* in (6), for instance, were taken phonologically as a single syllable as in *a.kia.ni*, the *kia* to be rhythmically accentuated would be expected to constitute a foot together with the preceding syllable (as *[a.kía/ni], like *a.kim.ni* [a.kím/ni] 'across from me'), and there would be *no* immediate reason for the preceding syllable to be accentuated and geminated. It is because *kia* itself is ambisyllabic at one level that the preceding syllable *a* has to become a separate foot through accent regression coupled with gemination.

A vowel cluster and a double vowel behave in exactly the same way. Compare the following pair (7) and (8), the latter of which contains a double vowel as contrasted with a single vowel in the former and is accordingly subject to accent regression:

(7) *a.ta.ta* → *a.tá.ta* (II) [atá·/ta]
'later'

(8) *a.ta.a.ta* → *a.tá.a.ta* (II) → *à.ta.a.ta* (IIIa) → *à.ta.á.ta* (II) [àt/taá/ta]
'paternal uncle.'

Note the difference in the number of feet, which is due to the fact that the first syllable in (8), unlike that in (7), constitutes a monosyllabic foot as the result of accent regression and gemination. See 2.2 and fn. 8 as to the possible phonetic difference between [taá] in (8) and [tá·] in (7).

Next, compare the following pair, which likewise contrast as regards a single vs. double vowel:

(9) *ak.ngir.tat.nga* → *ák.ngir.tát.nga* (I,II) [ák/ŋixtát/ŋa]
'they hurt me (interrogative mood)'

(10) *a.ngir.ta.at.nga* → *ák.ngir.ta.át.nga* (I,II,IIIa,II) [ák/ŋix/taát/ŋa]
'they hurt me (indicative mood)'

Note the occurrence of accent regression in (10) but not in (9) and the resultant difference in the number of feet. As compared with (8), the syllable onto which accent regresses in (10) is primarily a closed one and as such it constitutes a monosyllabic foot without quantitative change (i.e. gemination). On the other hand, example (11) below, which ends in the same indicative ending *-aatnga* as does (10), has nevertheless no accent regression, unlike (10):

(11) *ce.ñir.ta.at.nga* → *ce.ñír.ta.át.nga* (II) [cəníx/taát/ŋa]
'they visit me.'

Note that rhythmic accent by Rule II falls on the second vowel of the double vowel in (11) but on the first in (10) and that, accordingly, the double vowel in (11) forms a foot without any foot

restructuring through accent regression.

As mentioned in 3.2, a closed syllable in a monosyllabic foot sounds measurably longer than one in a disyllabic foot (although instrumental investigation remains to be done). This is the case with [ŋix] in (10), which is longer than [ŋix] in (9) or [nix] in (11). Compare also the following pair, both of which have an accented closed syllable with the same segmental sequence *(lur)*:

(12) *u.lur.ni.a* → *u.lúr.ni.á* (II) → *u.lúr.ni.a* (IV) [ulúɣ/nia]
'he says she looked away'

(13) *ul.'ur.ni.a* → *úl.'ur.ni.a* (I,II) → *úl.'ùr.ni.a* (IIIa) → *úl.'ùr.ni.á* (II) → *úl.'ùr.ni.a* (IV) [úl/lùɣ/nia]
'he says it is slowly flooding.'

The first syllable in (13) is closed because of the non-automatic geminate *l* as indicated by the apostrophe (see 4 above), which is connected with the phonological shape of the base *ule-* 'to flood', the factor mentioned in 1.2. The regressively accentuated syllable *lúr*, which constitutes a monosyllabic foot in (13), sounds longer in duration as a whole than the rhythmically accentuated syllable *lúr* within the disyllabic foot in (12). It is as if the monosyllabic foot in (13) were "stretching" itself between the two flanking feet so as to assert its independent foot status. See also (64) vs. (65) in 6.5.1.3.

Application of Rule IIIa is blocked before a word (enclitic or non-enclitic) boundary inside a phonological phrase–an instance of foot structuring for boundary signaling–as will be seen in 6.3.

5.2.2.

Except in the Norton Sound dialect (north of Kotlik), a foot consisting of a closed syllable followed by an open one must be avoided. Otherwise the closed syllable, in spite of its greater accentual capacity, would be a weak syllable in a foot whose strong syllable is an open one; such a foot would be unbalanced.

If rhythmic accent is due to fall on an open syllable immediately preceded by a closed syllable, the accent regresses onto the closed one (Rule IIIb), e.g.

(14) *at.rar.lu.ni* → *át.rar.lú.ni* (I,II) → *át.ràr.lu.ni* (IIIb) → *át.ràr.lu.ni* (II,IV) [át/xàɣ/luni]
'(he) going down.'

Note that the primarily unaccented closed syllable *rar* is regressively accentuated by Rule IIIb so as to constitute a monosyllabic foot instead of constituting a disyllabic foot with the following open syllable (i.e. instead of *[át/xaɣlú·/ni]); cf. (14a) below.

(15) *ca.nga.ten.ri.tu.a* → *ca.ngá.ten.ri.tu.a* (II) → *ca.ngá.tèn.ri.tu.a* (IIIb) → *ca.ngá.tèn.ri.tú.a* (II) → *ca.ngá.tèn.ri.tu.a* (IIIa) → *ca.ngá.tèn.ri.tu.a* (II,IV) [caŋá·/tɔn/ɣit/tua]
'there is nothing wrong with me.'

Note that the primarily unaccented closed syllable *ten* is regressively accentuated by Rule IIIb, while the rhythmically accentuated open syllable *ri* has its accent regressed onto the preceding closed syllable *ten* but is again accentuated by Rule IIIa to become a closed syllable through gemination, hence two monosyllabic feet owing to two regressions; cf. (15a) below.

Application of Rule IIIb is blocked before a boundary (enclitic, non-enclitic, or phonological unit), another instance of foot structuring for boundary signaling, as will be seen in 6.4. A conse-

quence of this is that before an enclitic there occurs a foot consisting of a closed syllable followed by an open one; see e.g. (33) and (39).

Rule IIIb does not operate in the Norton Sound dialect, where the rhythmic accent due to fall on an open syllable immediately preceded by a closed one does not regress. Thus, it follows that this dialect allows a foot to consist of a closed syllable followed by an open one, irrespective of a word boundary. Thus, the examples in (14) and (15) above occur in the slightly different surface forms:

(14a) *at.rar.lu.ni* → *át.rar.lú.ni* (I,II) [át/ɣaɣlúˑ/ni]

(15a) *ca.nga.ten.ri.tu.a* → *ca.ngá.ten.ri.tua* (II,IV) [caŋáˑ/tənɣíˑ/tua].

A question may be raised as to whether the regression in (10) and (13) in 5.2.1 is actually due to Rule IIIa. It may seem that either Rule IIIa or IIIb could be responsible for these regressions. However, as those words show regression also in the Norton Sound dialect, which has no Rule IIIb, it should be concluded that the regression is due to Rule IIIa.

5.2.3.

A foot of the form CV.C*e* must be avoided. The device for this is to change the sequence into a monosyllabic foot through accent regression coupled with *e* syncopation.

If rhythmic accent is due to fall on an open syllable with *e* immediately preceded by an open syllable, the accent regresses onto the preceding syllable, with the *e* being syncopated (Rule IIIc), e.g.

(16) *ang.ya.nge.ciq.sug.nar.quq* → *áng.ya.ngé.ciq.sug.nar.quq* (I,II) →
áng.yàng.ciq.sug.nar.quq (IIIc) → *áng.yàng.ciq.súg.nar.quq* (II,IV)
[áŋ/yàŋ/ciqsúɣ/naɣquq]
'he will probably get a boat.'

Note that the underlying sequence *yange* becomes a monosyllabic foot. Compare this with the following, which differs only in the initial syllable:

(17) *qa.ya.nge.ciq.sug.nar.quq* → *qa.yá.nge.ciq.sug.nár.quq* (II)
[qayáˑ/ŋɔcíq/suɣnáɣ/quq]
'he will probably get a kayak.'

Rule IIIb does not operate on (17) since the rhythmic accent does not fall on *nge*.

Mention will be made in 5.2.4 of variants for (16) and (17).

Rule IIIc is blocked if the consonants flanking the *e* are identical (or are *c* and *t*, or *q* and *rr*). Compare the following pair, which differ only in the consonant following the second *e*:

(18) *ke.me.ni* → *ke.mé.ni* (II) → *kém.ni* (IIIc) [kə́m/ni]
'his own flesh'

(19) *ke.me.mi* → *ke.mé.mi* (II) [kəmə́m/mi]
'of his own flesh.'

In (18) the second *e* is syncopated due to Rule IIIc, but in (19) the rhythmic accent by Rule II stays on the *e* without syncopation. Here we encounter an instance of an accented syllable with *e*. Since the vowel *e* cannot be lengthened, unlike a full vowel, the only phonetic process that the open syllable can take to retain the vowel and to bear the weight of a strong syllable is to become closed

through gemination (3.2). This blocking of Rule IIIc, as in (19), clearly functions to avoid a consonant cluster which might be difficult to distinguish from a geminate. Rule IIIc is not blocked, however, in the Hooper Bay-Chevak dialect, which does indeed permit such clusters (rearticulated, distinct from geminates).

Rule IIIc does not operate in the Norton Sound dialect; a rhythmic accent, if any, stays on the *e* of any CVC*e* sequence and the syllable becomes closed through gemination as in (19). Accordingly, examples (16) and (18) above occur in the slightly different surface forms:

(16a) *ang.ya.nge.ciq.sug.nar.quq* → *áng.ya.ngé.ciq.súg.nar.quq* (I,II,IV)
[áŋ/yaŋɔc/ciqsúɣ/naχquq].

(18a) *ke.me.ni* → *ke.mé.ni* (II) [kəmən/ni].

As for (17) and (19), to which Rule IIIc does not apply, there is in these no difference between the Norton Sound dialect and the other dialects.[12]

5.2.4.

Going back to (16), this form has another variant besides Norton Sound (16a). Compare the following (16b) with (16):

(16) [áŋ/yàŋ/ciqsúɣ/naχquq]

(16b) [áŋ/yaŋcíq/suɣnáχ/quq].

This type of variation seems to be of a regional and/or idiolectal nature, possibly with dialect mixture. In some areas only one of the variants predominates, while in other areas both variants may be heard with similar frequency. Examples abound:

(20) [ís/χàt/kəɬχún/ɣitá·/qa] (underlying *issratekellrunritaqa*)
'this was not my grass bag'

(20a) [ís/χatkɔ́ɬ/χùn/ɣitá·/qa]
'idem.'

(21) [taŋɔ́χ/cɔ̀t/laχtuq] (underlying *tangercetelartuq*)
'he usually lets himself be seen'

(21a) [taŋɔ́χ/cɔ̀tɬáχ/tuq]
'idem.'

For the latter example there is still another variant (21b), which will be discussed at the end of this section. The accentuation in (20) and (21) is explained by Rule IIIc, as is the case with (16):

(20) *iss.ra.te.kell.run.ri.ta.qa* → *íss.ra.té.kell.run.ri.ta.qa* (I,II) →
íss.rat.kell.run.ri.ta.qa (IIIc) → *iss.rat.kell.rún.ri.tá.qa* (II)
[ís/χàt/kəɬχún/ɣitá·/qa].

[12]Mention should be made in this connection of a certain peculiarity observed at Kotlik, which belongs to the Norton Sound dialect. Although Rule IIIc does not operate in the speech of some Kotlik people, there are many who employ the rule just as in the other dialects, using, for instance, (16) rather than (16a). Moreover, concerning Rule IIIb as well, there is fluctuation among speakers or even for a single speaker (see Miyaoka 1970:167). Most likely this kind of variation and fluctuation is indicative of dialect mixture. In fact, Kotlik is now in rapidly increasing contact and communication with other Yukon and Kuskokwim villages which are dialectally General Central Yupik (as identified in Jacobson 1984).

(21) *ta.nger.ce.te.lar.tuq* → *ta.ngér.ce.té.lar.tuq* (I,II) →
ta.ngér.cèt.'lar.tuq (IIIc) → *ta.ngér.cèt.'lar.tuq* (II,IV)
[taŋɔ́x/cɔ́t/laχtuq], with the apostrophe in the orthographical representation indicating that the following *l* is not devoiced (see 4).

For the other variant for each pair (16b, 20a, 21a), the following variant for (17) should be illuminating. Compare the following (17a) with (17):

(17) [qayá·/ŋɔcíq/suγnáχ/quq] (underlying *qayangeciqsugnarquq*)

(17a) [qayáŋ/ciqsúγ/naχquq].

This pair from the same underlying form shows that in (17a) the *e* before *ciq* has been deleted at an earlier level, before accentuation applies:

(17a) *qa.ya.nge.ciq.sug.nar.quq* → *qa.yang.ciq.sug.nar.quq* (*e* deletion) →
qa.yáng.ciq.súg.nar.quq (II,IV) [qayáŋ/ciqsúγ/naχquq].

Some suffixes, e.g. *-ciqe-* 'will', are variable in that they may or may not delete a preceding *e*, depending on dialect area (and speaker). In (17b) *-ciqe-* acts as an *e*-deleting suffix type, but in (17) it does not. This contrast can also account for the pairs (16) vs. (16b), (20) vs. (20a), and (21) vs. (21a). The underlying *e* is retained in (16), (20), and (21) before the suffix in question but is suppressed by Rule IIIc in connection with accent regression, while the *e* is deleted in (16b), (20a), and (21a) because of the suffixes which are of the *e*-deleting type:

(16b) *ang.ya.nge.ciq.sug.nar.quq* → *ang.yang.ciq.sug.nar.quq* (*e* deletion) →
áng.yang.ciq.sug.nár.quq (II) [áŋ/yaŋciq/suγnáχ/quq]

(20a) *iss.ra.te.kell.run.ri.ta.qa* → iss.rat.kell.run.ri.ta.qa (*e* deletion) →
iss.ra.kéll.run.rí.ta.qa (I,II) → *iss.rat.kéll.rùn.ri.ta.qa* (IIIb) →
iss.rat.kéll.rùn.ri.tá.qa (II) [is/χatkɔ́ł/χùn/γitá·/qa]

(21a) *ta.nger.ce.te.lar.tuq* → *ta.nger.cet.lar.tuq* (*e* deletion) →
ta.ngér.cet.lár.tuq (I,II) [taŋɔ́χ/cɔtɬáχ/tuq].[11]

In this connection the voiced vs. voiceless contrast in (21) [laχ] and (21a) [ɬaχ] should be noted. The devoicing as in (21a) is clearly related to the suffix-conditioned *e* deletion and the deletion, which places the *l* adjacent to the voiceless stop *t*, precedes not only accentuation but also devoicing. Compare also the following pair:

(22) *ne.re.ci.quq* → *ne.ré.ci.quq* (II) → *nèr.'ci.quq* (IIIc) [nɔ̀γ/ciquq]
'he will eat.'

(22a) *ne.re.ci.quq* → *ner.ci.quq* (*e* deletion) → *nér.ci.quq* (I,II,IV) [nɔ́χ/ciquq]
'idem.'

The former variant (22) has *e* suppressed in connection with accent regression, keeping the *r* voiced as indicated by the apostrophe, while the latter (22a) is subject to suffix-conditioned *e* deletion, followed by devoicing of *r*.

Although detailed dialectal documentation still remains to be done for the accent variation connected with the suffixes concerned, the variant with suffix-conditioned *e* deletion before *-ciqe-*

[11] In the same way as the examples in fns. 5 and 11, we may be allowed to use the apostrophe for (16), (20), and (21) as differentiated from (16b), (20a), and (21a): e.g. (16) *angya'ngciqsugnarquq* vs. (16b) *angyangciqsugnarquq*.

(16b, 22a) seems to occur more frequently in the Kuskokwim and Hooper Bay-Chevak dialects than in the Yukon dialect, where accent-related *e* suppression (16, 22) seems to be general. In the case of *-lar-*, on the other hand, suffix-conditioned *e* deletion (21a) is more general in the Yukon dialect.

Regarding the voiced vs. voiceless contrast, the following variant (21b) is probably much more common in the Kuskokwim dialect than (21), which latter is yet very common among the elders.

(21b) *ta.ngér.cet.'lár.tuq* [taŋɔ̀ɣ/cɔtlá̰ɣ/tuq].

The voiced *l* apparently indicates that, unlike the Yukon variant (21a), suffix-conditioned *e* deletion has not occurred here; the suffix *-lar-* is not of the *e*-deleting type in the Kuskokwim dialect. As has been abundantly demonstrated, a monosyllabic foot as in (21) is a necessary foot structure preference. On the other hand, it basically remains that a disyllabic foot is more natural than a monosyllabic one. Too many monosyllabic feet in succession make accentuation purposeless, in not producing contrasts in syllable prominence. The type of accent shown in (21b) is highly interesting in that it apparently indicates a kind of accent readjustment from (21) in favor of disyllabic feet (rather than a succession of monosyllabic feet), which seems to have started particularly in the younger generation. Compare also the following pair:

(23) [táŋ/vàx/pɔ̀k/naki]
'don't look at them!'

(23a) [táŋ/vaxpèk/naki]
'idem'

The former variant with three monosyllable feet, which is quite common among older people, is the result of the regular application of regressive accent:

(23) *tang.vag.pe.ke.na.ki* → *táng.vàg.pe.ke.na.ki* (I,II,IIIb) →
táng.vàg.pèk.'na.ki (II,IIIc,II,IV) [táŋ/vàx/pɔ̀k/naki].

As for (23a) the accentuation in it might appear to indicate suffix-conditioned *e* deletion before the appositional mood marker *-na-*. However, if that were the case, the nasal of the marker should be voiceless: *[táŋ/vaxpɔ̀k/naki] (I,II) ← [taŋ.vax.pɔk.na.ki] (devoicing) ← *tang.vag.pek.na.ki* (*e* deletion) ← *tang.vag.pe.ke.na.ki*. In fact, the voiced *n* indicates that, like (21b) from (21), accent is readjusted from (23), presumably in order to avoid the three monosyllabic feet in succession in favor of a disyllabic foot.

5.2.5.

To summarize accent regression, the three cases discussed above (5.2.1 through 5.2.3) may be represented as follows:

Rule IIIa $(C)V(C_1).C_2\acute{V}.V(C) \rightarrow \begin{cases} [(C)\acute{V}C_1/C_2VV(C)] \cdots C_1 \neq 0 \\ [(C)\acute{V}C_2/C_2CC(C)] \cdots C_1 = 0 \end{cases}$

Rule IIIb $CVC.C\acute{V}.CV(C) \rightarrow$ $[C\acute{V}C/CVCV(C)]$

Rule IIIc $CV.C_1\acute{e}.C_2V(C) \rightarrow$ $[C\acute{V}C_1/C_2V(C)] \cdots C_1 = 0$

It should be easy to see that accent regression is a prosodic process related to preferential tendency or surface constraint in foot structuring. The avoidance of some types of feet in favor of others is to be explained in terms of the difference between open and closed syllables in accentual capacity to bear the weight of a strong syllable.

It should be clear from the table above that, in any of the three cases, accent regression occurs from a rhythmically accentuated open syllable in such a way that a foot having the open syllable as its strong syllable is avoided, and the preceding syllable is strengthened, resulting in a monosyllabic foot. The preceding syllable must be closed, in order to bear the weight of a monosyllabic foot. This explains the fact that, if the preceding syllable is primarily an open one, it becomes closed through gemination (IIIa in the case of $C_1 = 0$) or through *e* syncopation (IIIc). On the other hand, in the case of (IIIa, $C_1 \neq 0$) and (IIIb), there is no need or no possibility for gemination, since the preceding syllable is primarily closed. Thus it may safely be concluded that (i) consonant gemination and vowel lengthening are two different phonetic realizations connected respectively with a regressively accentuated open syllable and with a rhythmically accentuated open syllable (except those with *e*), and that (ii) both quantitative changes can best be explained in terms of foot restructuring conditioned by accentual capacity of syllables.

5.3. Deaccentuation (Rule IV)

The final syllable of a word may be accentuated by Rule II, but it never occurs accented at the phonetic surface if it comes at the end of a phonological unit, i.e., if it is immediately followed by pause (#).

If rhythmic accent is due to fall on a word-final syllable, that syllable is deaccentuated before # and = (Rule IV).

A deaccentuated syllable before a non-enclitic boundary (=) is subject to another accentuation (Rule Va), as will be seen in 6.5.1. Deaccentuation before # is abundantly represented in the examples already cited. A consequence of this rule is a hypermeter of the type consisting of two successive weak syllables (5.1). Such a hypermeter carries the demarcative function of signaling the end of a phonological unit, together with other boundary-signaling features, above all pause.

An apparent exception to word-final deaccentuation may be found in questions, such as (24) below. Heard particularly among the younger generation, this kind of expression may probably be considered an abbreviated form from (24a) with the interrogative particle *qaa*:

(24) *qayaliciquten* [qayá·/licí·/qutɔ̀n] (with rising tone on [tɔn])
'will you (sg.) make a kayak?'

(24a) *qayaliciquten* = qaa [qayá·/licí·/qutɔ̀n/qaa] (in which the same three syllables are accented as in (24), but the tone falls rapidly after [tɔn]; see 6.5.1.3 for accent on [tɔn])
'idem'.

A deviation from the word-final prosodic adjustment is shown by the Nunivak dialect. Deaccentuation is relevant to this dialect also, but when a word is final in an utterance or is uttered in isolation, word-final deaccentuation is accompanied by regressive accent on a penultimate open syllable: a penultimate open syllable is regressively accentuated, if it is not rhythmically accentuated, i.e., if rhythmic accent is due to fall on the word-final syllable. Compare the Nunivak forms (25a) and (26a) with the non-Nunivak (25) and (26) respectively:

(25) *iv.ru.ciq* → *iv.ru.ciq* (I,II,IV) [iv/ɣuciq]
'waterproof boot'

(25a) *iv.ru.ciq* → *iv.ru.cir* (I,II,IV + regression) [iv/ɣuc/cix] (also with the final voiceless fricative characteristic of the Nunivak dialect)
'idem'

(26) *ma.li.gu.tuq* → *ma.li.gu.tuq* (II,IV) [malí·/ɣutuq]
'he goes along with'

(26a) *ma.li.gu.tuq* → *ma.li.gu.tur* (II,IV + regression) [malí·/ɣut/tux]
'idem.'

More boundary-related gemination will be shown in 6.5.

5.4. Dialectal variations

The CY accentuation pattern of the general type so far discussed is very uniform, except for variations concerning accent regression (5.2.2, 5.2.3, 5.3), although additional variations will be observed in other types of prosodic phenomena which are not of a mechanical nature (i.e., those mentioned at the beginning of 1.2).

The deviation mentioned in 5.3 is specific to the Nunivak dialect. Rules IIIb and IIIc are absent in the phonology of the typical Norton Sound dialect, e.g. (14a, 15a, 16a, 18a); see also fn. 12. At least in this respect, we may say that of all CY dialects, Norton Sound, which is characterized by the fewest deviating rules, has the simplest prosodic system. Historically, it is much more likely that there has been increasing complication in the more southerly dialects, rather than simplification in the northern ones. The two regression rules, IIIb and IIIc, seem to be later developments in the dialects south of Norton Sound. (Again it is interesting to note the apparently recent innovation in the southern area (Kuskokwim) in the form of accent readjustment favoring a disyllabic foot, 5.2.4.) This southward increase in complexity of accentuation rules was beautifully demonstrated by Leer (1977) for the whole Yupik language complex, including the intervening Seward Peninsula Inupiaq dialect (which has a characteristic phenomenon of consonant lenition apparently conditioned by what reminds one of the CY accentuation pattern, see Kaplan, this volume).

6. Accentuation for boundary signaling

As in many languages, one of the important linguistic functions of the prosodic pattern in CY is demarcative, that is, in signaling a word boundary. There are three kinds of these in CY: # (phonological unit), = (non-enclitic word inside a phonological unit), and – (enclitic). The greater number of phonological features responsible for boundary signaling are prosodic, although there are some which might not usually be regarded as prosodic (e.g., glottal stop and certain segmental adjustments).[11] One feature demarcates one or two kinds of boundary from the other(s), and a number of different features conspire to signal one kind of boundary. Some of the features correlate with each other. Some features are optional, and for that very reason their occurrence helps emphasize the boundary, which is obligatorily signaled by other features. Some features predominate depending upon the context and thereby serve the demarcative purpose more positively than others.

Most of the prosodic features responsible for boundary signaling are derived from those accentuation rules which have been formulated above; the boundary is sometimes signaled by the blocking of one or more of these rules. It is important to note the following in advance:

(i) Two segments flanking a boundary (either enclitic or non-enclitic) belong to separate syllables. In other words, a boundary cannot fall within a CY syllable (in sharp contrast to French, for example, where liaison regularly obscures word boundaries, e.g. *mes amis y vont en auto* [me.za.mi.zi.võ.tã.no.to]). This implies that some prosodic processes may take place against the syllable division principle (2.2) across a boundary.

[11] See, for instance (66) and the word-final adjustment of *ə* (2.2).

(ii) Two syllables flanking an enclitic boundary may or may not belong to the same foot, while two syllables flanking a non-enclitic boundary may never belong to the same foot, i.e., the boundary – can fall within a foot, while the boundary = cannot. This is one respect in which the enclitic boundary is distinguished from the non-enclitic.

6.1. Word-final deaccentuation and unit-final accented syllables

Final deaccentuation with its consequent disyllabic hypermeter (Rule IV) and a unit-final accented syllable (with greatest prominence, 3.2) serve the purpose of signaling the end of a phonological word. Compare the following three, in which the same word *qayaliciquci* is followed by #, =, or –, and the prime-accented syllable is indicated by the highest level of tone:

(27) *#qayaliciquci#amani#* [qayá·/licí·/quci amá·/ni]
'you will be making a kayak over there'

(28) *#qayaliciquci=amani#* [qayá·/licí·/quci/amá·/ni]
'idem'

(29) *#qayaliciquci-am#* [qayá·/licí·/qucí·/am]
'you will be making a kayak again.'

Note that the rhythmic accent on pre-boundary *ci* by Rule II is deaccentuated in (27) by Rule IV but is retained in (29). In (28) it is deaccentuated as in (27), but the pre-boundary syllable is again accentuated by a later rule ('pre-boundary regressive accent', Rule V, to be introduced in 6.5.1). Compare also the following three:

(30) *#angyaliciquci#amani#* [áŋ/yalí·/ciqú·/ci amá·/ni]
'you will be making a boat over there'

(31) *#angyaliciquci=amani#* [áŋ/yalí·/ciqú·/ci/amá·/ni]
'idem'

(32) *#angyaliciquci–am* [áŋ/yalí·/ciqú·/ci·/am] (see 6.5.2.2 for lengthening on pre-boundary *ci*.)
'you will be making a boat again.'

6.2. Rhythmic accentuation

Rhythmic accentuation (Rule I and Rule II) differentiates an enclitic boundary (–) from a non-enclitic (=) within a phonological unit. An enclitic is accentuated as part of the preceding word, that is, merely as an additional syllable of the word to which it is attached. Across a non-enclitic boundary, on the other hand, rhythmic accentuation by Rule II is blocked. A non-enclitic word after the boundary (=) is accentuated anew by Rule I and Rule II, starting from its own initial syllable. Compare the following:

(33) *#qayaliciquq–llu–gguq#* [qayá·/licí·/quqłú·/xuq]
'he will make a kayak also, they say'

(34) *#qayaliciquq=malrunlegnek#* [qayá·/licí·/qûq/mál/ɣunlɔ́ɣ/nɔk]
'he will make seven kayaks'

In (33) the enclitic *–llu* is accentuated by Rule II and constitutes a foot together with the preceding syllable *quq*. (It should be noted, however, that accent regression by Rule IIIb is blocked before the enclitic *-gguq*; cf. 5.2.2. For this see further 6.4.) In (34), on the other hand, the post-boundary

syllable *mal* is accentuated by Rule I, with Rule II being blocked across the boundary; see 6.5.1.3 for the accent on *qiiq*.

6.3. Blocking of Rule IIIa

Since accent regression by Rule IIIa (5.2.1) is a device for clustering two consecutive vowels into a single foot, when it is blocked before a boundary (enclitic or non-enclitic) within a phonological unit, the two vowels are separated into different feet, thereby maintaining a manifest boundary. Compare the following:

(35) *#caliam#* → *#càliam#* (II,IIIa,II,IV) [càl/liam]
'of the work'

(36) *#cali-am#* → *cali-am#* (II) [calí·/am]
'work (now)!'

(37) *#cali = amani#* → *#cali = amáni* (II,IV,Va,II) [calì/amá·/ni]
'work over there!'

In (35) the two vowels *i* and *a* belong to one foot, phonetically constituting a single syllable, due to accent regression by Rule IIIa. In (36), however, the two vowels have hiatus between them and belong to two separate feet, owing to the blocking of accent regression. Regression is also blocked before the non-enclitic boundary in (37), where deaccentuation (Rule IV) and an additional rule (Rule Va, 6.5.1.4) differentiate the boundary from an enclitic boundary. Otherwise, (37) would be accentuated as *[càl/lía·/mani] (by Rules II,IIIa,II,IV) with two syllables across = falling into a single foot.

6.4. Blocking of Rule IIIb

Given that Rule IIIb is a device for separating an open syllable from the preceding closed one and combining it with the following syllable into a foot (5.2.2), it is not surprising that the rule is blocked before a boundary (enclitic or non-enclitic). Combination of the pre-boundary open syllable with the post-boundary syllable into a foot would obscure the boundary. Compare the following:

(38) *#angyarkami#* → *#ángyàrkami#* (I,II,IIIb,II,IV) [áŋ/yàx/kami]
'in the material for boats'

(39) *#angyagka-mi#* → *ángyagkà-mi#* (I,II) [áŋ/yaxkà·/mi]
'how about my two boats?'

(40) *#angyagka = mikenrituk#* → *ángyagkà = mikénrituk#* (I,II,IV,Va,II,IV)
[áŋ/yaxkàm/mikɔn/ɣituk]
'my two boats are not small'

(41) *#angyagka#* → *#ángyagka#* (I,II,IV) [áŋ/yaxka]
'my two boats.'

The syllable *ka* is followed in (38) by another syllable *(mi)* without any intervening boundary, in (39) by the enclitic boundary, in (40) by the non-enclitic boundary, and in (41) by pause. Accent regression of Rule IIIb takes place in (38) from *ka* to *yar*. It is blocked, however, in (39); hence vowel lengthening on *ka*. The blocking prevents the two syllables *ka* and *mi* across the enclitic boundary from falling into a single foot, thereby keeping the boundary manifest and distinguishing it from (38). In (40) and (41), accent regression is also blocked and the rhythmic accent on *ka* is deleted (Rule IV). In (40), however, the pre-boundary *ka* is again accentuated by another rule (Rule Va, 6.5.1.2).

Vowel lengthening in [ka·] of (39) as well as [ɬu·] of (33) is precisely what was treated as "secondary lengthening" in Miyaoka (1970). Now it should be understood that "secondary lengthening" is a result of the blocking of accent regression (Rule IIIb) before an enclitic, which is in turn conditioned by foot structuring for boundary signaling. An additional example (42) may be compared with (43):

(42) *#qusngirngalnguq-mi-llu#* → *qúsngirngálnguq-mi-llu#* (I,II)
[qúz/ŋiɣŋál/ŋuqmi·/ɬu]
'also, how about the goat?'

(43) *#qusngirngalngurpak-mi-llu#* → *#qúsngirngálngurpák-mi-llu#* (I,II)
[qúz/ŋiɣŋál/ŋuχpák/miɬu]
'also, how about the big goat?'

No accent regression occurs from *mi* to *nguq* in (42), since *mi* is followed by an enclitic boundary; hence vowel lengthening on *mi*. In (43), on the other hand, *mi* has no vowel lengthening, simply because it is not rhythmically accentuated and accordingly accent regression and the blocking thereof are out of the question.

The third type of accent regression (Rule IIIc) formulated in 5.2.3 is, as noted there, not relevant before a boundary, since no word ends in *e* at the phonetic surface owing to final segment adjustment, *e* → *a*/__# (see 2.2).

6.5. Pre-boundary regressive accent (Rule V)

Boundary signaling features discussed in 6.1 through 6.4 may be regarded as derivatives of Rules I through IV in that blocking them distinguishes one boundary from another and from no boundary. On the other hand, there is one boundary-signaling feature of a prosodic kind which is not a derivative of the foregoing rules but is proper to a boundary. This is termed here 'pre-boundary regressive accent' and takes place on the syllable preceding a non-enclitic boundary (Rule Va, 6.5.1) or, to a limited extent, an enclitic boundary (Rule Vb, 6.5.2). It is a leftward movement of accent caused by information about a following boundary. The qualitative change caused by it is gemination (except for one very specific case). Gemination takes place if one of the two segments flanking the boundary is consonantal. If the segments are both consonantal or both vocalic, the accent is realized only in tone and stress, except for case 6.5.2.2, in which it lengthens a vowel.

6.5.1.

A syllable preceding a non-enclitic boundary receives pre-boundary regressive accent (Rule Va). This applies after rhythmic accent (if any) on the pre-boundary syllable is deaccentuated by Rule IV. The process prevents the two syllables flanking the boundary from falling into a single foot. Four cases may conveniently be distinguished (6.5.1.1 through 6.5.1.4).

6.5.1.1.

In this case the pre-boundary segment is consonantal and the post-boundary segment is vocalic. Compare the following:

(44) *#nunat = ukut#* → *#nunát = ukut#* (II,IV,Va,II,IV) [nunát/tukut]
'this village'

(45) *#nunatukut#* → *#nunátukut#* (II,IV) [nuná·/tukut]
'we are visiting.'

In (45) the second syllable ends after *a* by the syllable division principle (2.2). In (44), on the other hand, the second syllable ends in dental closure and the third begins with its release; the regressive accent on *nàt* (Rule Va) attracts the *t* before = into the pre-boundary syllable through gemination, thereby putting both the syllable and the foot division at the non-enclitic boundary. This is also the case with the *n* before = in (46) below:

(46) *#nunanun = ukunun# → #nunánùn = ukúnun#* (II,Va,II)
[nuná·/nùn/nukú·/nun]
'to this village.'

Note that the pre-boundary *nùn* becomes a monosyllabic foot through regressive accentuation, thereby avoiding such a foot as consisting of two syllables flanking the boundary (*[nuná·/nunú·/kunun]).

The *t* in (44) as well as the *n* in (46) are geminated, according to Elsie Mather (personal communication) in the same way as the *t* not only in (8) *ataata* [át/taá/ta] but also in (64) below which has two contiguous *t*'s.

6.5.1.2.

In this case the pre-boundary segment is vocalic and the post-boundary segment is consonantal. Compare the following:

(47) *#nuna = tamana# → #nunà = tamána#* (II,IV,Va,II) [nunàt/tamá·/na]
'that (extended) land'

(48) *#nunataqama# → #nunátaqáma#* (ii) [nuná·/taqá·/ma]
'whenever I visit.'

In (47) the regressive accent on *nà* (Rule Va) marks the boundary through gemination in a way similar to (44), while in (48) the rhythmic accent on *ná* (Rule II) lengthens the vowel. Another example:

(49) *#nunaka = tamana# → #nunákà = tamána#* (II,Va,II)
[nuná·/kàt/tamá·/na]
'that (extended) land of mine.'

The regressive accent on *kà* makes a monosyllabic foot out of the pre-boundary syllable through gemination. The gemination in (49) is a device for preventing the pre-boundary syllable from falling into a foot with the post-boundary syllable (*[nuná·/katá·/mana]); thus, it is easy to see that, if two consecutive vowels precede the boundary, the regressive accent is not realized in gemination (but only in stress and tone): the pre-boundary two vowels (with the preceding consonant) cannot fail to constitute a foot because of Rule IIIa. Compare the following (50) with (49) and also with (52):

(50) *#nunakaa = tamana# → #nunákaà = tamána#* (II,IV,Va,II)
[nuná·/kaà/tamá·/na]
'that (extended one) is his land'

(51) *#nunakaa#tamana# → #nunákaa#tamána#* (II,IV,II)
[nuná·/kaa tamá·/na]
'that (extended one) is *his* (emphasis) land.'

Some particles almost never occur without being attached to a preceding word and forming

a phonological unit together with it, though they are not enclitics. They are characterized by the same regressive accent as in (47) and (48), e.g.

(52) *#pikna = wani# → #píknà = wani#* (I,Va,II,IV) [pík/nàxʷ/xʷani]
'the one up there'
(where *wani* is a meaningless "word-filler" rather than the adverbial demonstrative for 'here')

(53) *#kina = tanem# → #kinà = tanem* (II,IV,Va,II,IV) [kinàt/tanəm]
'who ever?'

Reconsideration of the so-called "enclitic *qaa*" may not be out of place here. The interrogative particle *qaa* has been treated in the past as an enclitic in spite of its uniqueness in that it can occur independently, without being attached to another word (*#qaa#* [qaa] 'is that so?'). It should be clear by comparing the following pair, noting the pre-boundary regressive accent before *qaa*, quite like that in (55), that the particle is actually not an enclitic but rather a non-enclitic word characterized by =:

(54) *#qayaqaqa = qaa# → #qayáqaqà = qaa#* (II,IV,Va,II,IV)
[qayá·/qaqàq/qaa]
'is it my kayak?'

(55) *#qayaqaqa = tauna# → #qayáqaqàtauna#* (II,IV,Va,II)
[qayá·/qaqàt/tauna/]
'that is my kayak.'

If the *qaa* is an enclitic (like **#qayaqaqa-qaa#*), one should expect **[qayá·/qaqá·/qaa]*.

There are also a number of monosyllabic words which, like enclitics, occur as additional syllables of the preceding word but which must be distinguished from enclitics. These non-enclitic monosyllabic words which begin with a consonant are also characterized by the pre-boundary regressive accent of 6.5.1.2. Compare non-enclitic (56) and (58) with enclitic (57) and (59):

(56) *#qayaqa = tang# → #qayáqà = tang#* (II,Va,I,IV) [qayá·/qàt/taŋ]
'look, my kayak'

(57) *#qayaqa-tuq# → #qayáqa-tuq#* (II,IV) [qayá·/qatuq]
'my kayak, I hope'

(58) *#ayuqli = kin# → #ayúqli = kin#* (II,Va) [ayúq/ɬik/kin]
'I wish it were like (...)'

(59) *#ayuqli-kiq# → #ayúqli-kiq#* (II,IV) [ayúq/ɬikiq]
'I hope it will be like (...).'

Fluctuation exists among speakers in the case of the open-syllable particle *wa*, which is non-enclitic for some (60) but enclitic for others (61); compare the following:

(60) *#wani = wa# → #wanì = wa#* (II,IV,Va) [xʷanìxʷ/xʷa]
'here'
(as in *wani = wa aqumgalria* 'he is sitting here')

(61) *#wani-wa# → #wani-wa#* (II) [xʷaní·/xʷa]
'idem.'

Note also that the following (62) is one word as a whole (with no intervening boundary) and has no alternative form like (60):

(62) *#waniwa#* → *#waniwa#* (II) [xʷaní·/xʷa] 'here it is (interjection).'

6.5.1.3.

In this case both segments flanking a non-enclitic boundary are consonantal. Here the accent is not realized in gemination but only in tone and stress, e.g.

(63) *#qayaman = tekituq#* → *#qayámàn = tekituq#* (II,Va,II)
[qayá·/mun/teki·/tuq]
'he came to the kayak'

(64) *#qayat = tallimaugut#* → *#qayàt = tallímaúgut#* (II,IV,Va,II)
[qayàt/taɬí·/máu/ɣut]
'there are five kayaks'

(65) *#qayat = takpiartut#* → *#qayàt = tákpiártut#* (II,IV,Va,I,II)
[qayàt/ták/piáɣ/tut]
'the kayaks are very long.'

Note that the preboundary syllable *màn* in (63) becomes a monosyllabic foot through regressive accent. The [t/t] in (64) and (65) are both geminate (not rearticulated). It is interesting to add here, however, that the geminate *t* in (64) is not exactly the same as that in (65). Elsie Mather (personal communication) keenly observes that the geminate in (65) is longer in duration than that in (64). It should be clear that, just as in (13) contrasted with (12), the monosyllabicity of the foot */tak/* is responsible for the "stretching" in (65), which makes the consonantal duration of *t* longer than in (64), cf. 3.2.

6.5.1.4.

In this case both the segments flanking a non-enclitic boundary are vocalic. An example may be seen in (37), repeated here:

(37) *#cali = amani#* → *#calì = amáni#* (II,IV,Va,II) [calì/amá·/ni].

As mentioned in 6.3, the pre-boundary regressive accent after deaccentuation characterizes the sequence of two vowels across the non-enclitic boundary in (37), distinguishing it from a sequence of two vowels across an enclitic boundary as in (36) or a sequence of two vowels with no intervening boundary, as in (34). The accent on *li* in (37) is not realized in vowel lengthening but in higher tone and greater stress as compared with e.g. *li* in *#cali#* [cali] (II,IV) 'work!, more'. This is the only case where the strong syllable in a disyllabic foot is open but unlengthened.

If a double vowel or a vowel cluster comes next to =, glottal stop may optionally occur to mark the hiatus. The greater the total number of vowels across = is (with a maximum of four), the more likely is the glottal stop, e.g.

(66) *#qayaa = aatama#* → *#qàyaà = aátama#* (II,IIIa,II,IV,Va,II,IV)
[qáy/yàa/ʔáa/tama]
'my father's kayak'

(67) *#qayaa = atama#* → *#qàyaa = atáma#* (II,IIIa,II,IV,Va,II)
[qày/yaà/(ʔ)atá·/ma]
'idem.'

In (67), with fewer vowels across the boundary than in (66), the glottal stop is less likely or even unnatural.

6.5.2.

The cases of pre-boundary regressive accent are fewer before an enclitic than before a non-enclitic word. This is due to the deaccentuation (Rule IV) which occurs before a non-enclitic boundary but not before an enclitic, and to the difference that, while two syllables flanking = are prevented from falling into a single foot by regressive accent, those flanking – can fall into a single foot, *unless* that event causes two segments across the boundary to fall into a single syllable.

No regressive accent takes place before an enclitic boundary in cases where the post-boundary segment is consonantal (cf. 6.5.1.2 and 6.5.1.3). In such cases, the pre-boundary syllable, if rhythmically accentuated, retains the accent, since deaccentuation is not applicable before an enclitic. Compare (47) and (49) in 6.5.1.2 with the following examples where only the post-boundary segment is consonantal:

(68) *#nuna-llu#* → *#nuná-llu#* (II) [nuná·/ɬu]
'also the land'

(69) *#nunaka-llu-gguq#* → *#nunáka-llú-gguq#* (II) [nuná·ˈkałú·/xuq]
'also my land, they say.'

Note that in neither of these does regressive accent occur on the pre-boundary syllable (hence no gemination of the post-boundary consonant), that in (68) the rhythmic accent is retained on *ná* (hence vowel lengthening), and that in (69) the two syllables across the first – constitute a foot ([kału·]).

Next, compare examples in 6.5.1.3, say (63), with the following, where the pre-boundary as well as the post-boundary segment are consonantal:

(70) *#qayaman-llu-gguq#* → *#qayáman-llú-gguq#* (II) [qayá·/munɬú·/xuq]
'also to the kayak, they say.'

It is important to note that the two syllables *mun-llu* in (70) and the *ka-llu* in (69) belong in each case to a single foot, while the two syllables *mun = te* in (63) and *ka = ta* in (49) belong in each case to separate feet. In the case of (69) and (70) the two syllables across the enclitic boundary fall into a single foot without any danger of two segments across the boundary falling into a single syllable.

On the other hand, in the case where the combination of two syllables across the enclitic boundary into a single foot would cause the two such segments to fall into a single syllable, some device is needed to avoid this. Hence we have regressive accent before an enclitic (Rule Vb), which takes place only in the cases where the post-boundary segment is vocalic (6.5.2.1 and 6.5.2.2) and another specific case (6.5.2.3).

(80) *#wall'u#* [xʷàɬ/ɬu]
'or'

(81) *#wani#* [xʷani]
'here.'

6.5.2.1.

In the case where the pre-boundary segment is consonantal and the post-boundary segment is vocalic (cf. 6.5.1.1), the pre-boundary regressive accent replaces the rhythmic accent, if any, on the pre-boundary syllable. Compare the following:

(71) *#qilagam#* → *#qilágam#* (II) [qilá·/ɣam]
'of the palate'

(72) *#qilag-am#* → *#qilàg-am#* (II,Vb) [qilàɣ/ɣam]
(a variant of *#qilak-am#* [qilàk/kam] in which the word-final devoicing of a fricative is blocked)
'again the sky'

(73) *#qilagmun-am#* → *#qilágmùn-am#* (II,Vb) [qiláɣ/mùn/nam]
'again to the sky.'

It should be seen that regressive accent in (72) and (73), which geminates the pre-boundary consonant, is thereby a device for preventing the boundary from falling within a syllable.

6.5.2.2.

In this case both segments flanking an enclitic boundary are vocalic (cf. 6.5.1.4). Compare the following:

(74) *#qanermiam#* → *#qanérmiam#* (II,IV) [qanə́ɣ/miam]
'of the thing held in the mouth'

(75) *#qanermi-am#* → *#qanérmì-am#* (II,Vb) [qanə́ɣ/mí·/am]
'in the mouth again'

(76) *#cuyarraam#* → *#cuyárraam#* (II,IV) [cuyá·/χaam]
'of a little bit of tobacco'

(77) *#cuyaqa-am#* → *#cuyáqà-am#* (II,Vb) [cuyá·/qà·/am]
'my leaf tobacco again'.

In (75) and (77) the regressive accent *lengthens* the pre-boundary vowel. Unlike the other cases of regressive accent, no gemination is possible, since there is no consonant next to the boundary. Accordingly, vowel lengthening should be the only way to prevent the pre-boundary vowel from falling into a single (phonetic) syllable with the post-boundary vowel, cf. the phonetically tautosyllabic [ia] (74) and [aa] (76). This is the only case where a single open syllable with a lengthened vowel constitutes a monosyllabic foot. See (32) for another example, but note at the same time that (29) has no need for regressive accent since the pre-boundary syllable *ci* is rhythmically accentuated and the foot division falls at the boundary.

Now it can safely be concluded, from 6.5.1.1 through 6.5.1.4, 6.5.2.1, and 6.5.2.2, that pre-boundary regressive accent is a phonetic device for distinguishing boundaries by preventing a non-enclitic boundary from falling within a foot and an enclitic boundary from falling within a syllable.

6.5.2.3.

Notwithstanding the remark in 6.5.2 that regressive accent does not take place before an enclitic which begins with a consonant, it does take place in the case where a single open syllable constitutes the pre-boundary word. (78) below with an enclitic boundary contrasts in accentuation with

(79), which has no intervening boundary:

(78) #*ca-mi*# [cám/mi] (Vb)
'then what?'

(79) #*cami*# [cami] (II,IV)
'in what?'

This type of regressive accent is optional, however, for some speakers, for whom the example (78) may occur with no regressive accent and be identical with (79). The same regressive accent may also be recognized in the particle (80) below, which presumably comes from the adverbial demonstrative base *wa-* 'here' and the enclitic *llu* 'and'. Compare the following, the latter of which is an adverbial demonstrative in the locative case from the same base as the former:

(80) #*wall'u*# [xʷál/ɬu]
'or'

(81) #*wani*# [xʷani]
'here.'

7. Conclusion

Accentuation in CY as surveyed in 5 and 6 operates automatically on the segmental sequence of a phonological unit (characterized by pause at both ends). Regressive accentuation, which disturbs the unidirectional operation of rhythmic accentuation, is best understood in terms of foot structuring, which is conditioned by the accentual capacity of syllables and by the need for boundary signaling. The other kinds of accentuation, of which only passing mention has been made in this paper, are not automatic in that they are specific to certain lexical items or to certain phonological shapes of bases or are conditioned by expressive factors.

It is important to see in CY a type of language where (i) stress, tone, and quantitative changes (consonant gemination and vowel lengthening) are simply different phonetic realizations of accent; (ii) the phonetic realizations of accent are all governed by a principle of foot structuring, itself based on syllable structure; and (iii) the foot principle also has the linguistic function of unifying a word and signaling different types of boundaries.

PROSODY IN ALUTIIQ
(The Koniag and Chugach dialects of Alaskan Yupik)

Jeff Leer

0. Introduction

0.1. Background

The **Alutiiq** language (elsewhere also called **Sugpiaq** and **Pacific (Gulf) Yupik**), although far outnumbered in speakers by **Central Yupik**, its closest relative, has a comparable geographic spread and comparable dialect diversity. Shortly before the advent of the Russians, these two languages could probably have been considered a dialect chain comprising a single language. That erstwhile language is here referred to as **Alaskan Yupik**, which includes Central Yupik and Alutiiq but excludes the Saint Lawrence Island variety of Central Siberian Yupik. The boundary now fixed between Alutiiq and Central Yupik near Egegik is probably the result of population movement during the historic period. We now believe that the original Bristol Bay (Aglegmiut) dialect was similar to Koniag Alutiiq on the one hand, and to the Nunivak dialect of Central Yupik on the other. The present-day Bristol Bay and Iliamna varieties of Central Yupik are virtually identical with that found farther north; this suggests recent intrusion of northern Central Yupik into the Bristol Bay area.

The following abbreviations are used for Alutiiq dialects and subdialects:

KA: Koniag Alutiiq (including the Alaska Peninsula and Kodiak)
- AP KA: Alaska Peninsula KA
  - GAP KA: Greater Alaska Peninsula KA (AP KA minus Perry KA)
  - Perry KA: Perryville KA
- Kodiak KA: Kodiak KA

CA: Chugach Alutiiq (including the Kenai Peninsula and Prince William Sound)
- KP CA: Kenai Peninsula CA
- PWS CA: Prince William Sound CA

Abbreviations occasionally used here for other languages and dialects are CY for Central Yupik, HBC for Hooper Bay-Chevak, NSU for Norton Sound-Unaliq, SY for Siberian Yupik, and CSY for Central Siberian Yupik (Saint Lawrence Island and Chaplinski).

The task of describing Alutiiq prosody sometimes involves considerable detail because of the close relationship between prosodic phenomena and other phonological processes. Moreover, Alutiiq dialects and subdialects, although sharing certain fundamental traits not characteristic of CY, nevertheless exhibit great diversity. For example, rules for assigning the first stress in the word are identical in KA and CA, but their rules for assigning subsequent stress differ in important ways. Much dialect variation is found with the devoicing rules presented in 2.3 and in the rules for frica-

tive dropping in 2.2. The reader should keep in mind, therefore, that this paper involves comparison and evaluation of dialectally varying rules, and is not intended to provide an optimal presentation of the rules for any particular dialect or subdialect.

The standard or "practical" orthographical representation, here called simply "the orthography," is an adaptation of the Central Yupik orthography developed by Krauss and Miyaoka and the Eskimo Language Workshop in 1968-72. This orthography is now in use in the few Alutiiq language programs currently operative, and has been used by the author in all materials developed to date, with some evolutionary modifications, especially in the representation of voiceless fricatives and in the undoubling rules. In this paper, all forms are cited in the orthography, usually further marked for the convenience of the reader with slashes representing foot divisions and acute accents indicating prosodic accent.[1] It should be understood that these markings are not part of the orthography.

The orthography is an adequate representation of the language at the "phonemic" level as distinct from the phonetic and morphophonemic levels. To facilitate typing and editing, however, we avoid special characters by recourse to digraphs, such as *ng* for /ŋ/, and unusual use of letters for phonemes, such as *e* for /ə/ and *r* for /ɣ/. Phonetic features such as syllable stress and length, fortition of syllable-initial consonants, and non-contrastive devoicing, being predictable from the "phonemic" syllabic composition of a word, are not indicated in the orthography.[2] Since the rules which assign these phonetic features are often quite complex, however, in this article a phonetic transcription is usually provided in brackets after the orthographical representation.

In general, the "phonemic" level here alluded to is quite close to the level which results from completing the application of morphophonemic rules. One main exception to this generalization is that where fricative dropping occurs (see 2.2), the identity of the fricative is not recoverable without recourse to morphological comparison; the dropped fricative is thus usually "replaced" by an apostrophe in the orthography. Also, where *e* is deleted between single consonants (see 3.2.1), resulting in a voiced *g* or *r* next to a voiceless consonant, an apostrophe between the consonants is used in CA and Perry KA to "represent" the deleted *e* that has prevented devoicing of the voiced fricative; the *e* itself is absent both phonemically and orthographically. Finally, gemination is indicated by an apostrophe after the geminated consonant except in the environment (C)V__VV (see 1.3.2).

0.2. Typology of rules

The rules presented in this paper are divided into four categories: the **pre-foot-definition rules** (pre-FD-rules), the **foot-definition rules** (FD-rules), the **phonetic adjustment rules** (PA-rules), and the **post-foot-definition rules** (post-FD-rules). These rules are applied in cycles. In each cycle the pre-FD-rules are applied first, then the FD-rules and the PA-rules associated with them, and finally the post-FD-rules. After this a new cycle begins, and so on to the end of the word. In each cycle, the output of the FD-rules is a **prosodic foot**. The foot boundary is here indicated by a slash separating the resulting foot from the rest of the word.

The steps involved in the application of these rules can be enumerated as follows:

> 1. Determination of the starting point of the **span** of syllables on which the prosodic rules are to operate. The span begins immediately following the foot boundary determined by the previous cycle. In the first cycle, the span begins at the beginning of the word (in this case, the word boundary is also the foot boundary). Depending on the rule applied, this span may include from one to three syllables.

[1] Indicating syllable division in the middle of a geminated consonant is sometimes problematic. If gemination is represented by an apostrophe, then the slash comes between the consonant and the apostrophe. In the case of "automatic gemination" due to FD-rule 1B (see 3.2.2), the slash follows the consonant; compare *ét'uq* [ət.:uq] 'she is present' and *ét/ua* [ət.:ua] 'I am present'.

[2] Two exceptional cases are handled orthographically with the acute accent: irregular length/accent in loans and irregular stressed *e* (see end of 1.3.4 and 3.5).

2. Going through the FD-rules until one is found to be applicable. This determines how many syllables are in the span.

3. Application of the pre-FD-rules to the span.

4. Application of the FD-rules to the span. In most cases, only one rule can apply in the cycle, but in the first cycle, FD-rules IA and IB (ordered before IC) output a closed syllable, which is then defined as a foot by IC (see 3.2).

5. Output of a foot. The output of all FD-rules except IA and IB output a prosodic foot, which is indicated in the rule by the slash indicating foot boundary.

6. Application of post-FD-rules to the foot just defined (in the case of post-FD-rule 5, to the last two feet defined).

7. Application of associated PA-rules to the foot. PA-rules which may apply following a given FD-rule are here noted in the discussion of the rule.

After this, a new prosodic cycle is begun using the foot boundary just assigned as a reference point to determine the new span. When this foot boundary coincides with word boundary, accent assignment is completed. Using this approach, all the necessary prosodic processes (pre-prosodic rules, foot definition, accent assignment, and phonetic adjustment) are accomplished in a single pass through the word.

The PA-rules deal with phonetic processes (fortition, gemination, syllable length and weight, stress and pitch) that apply to the syllabic structure of feet defined by the FD-rules. These rules are thus treated in section 1 together with the discussion of the sound system and syllable types.

The pre-and post-FD rules are treated together in section 2. These rules pertain to two major phonological phenomena: **fricative dropping** and **devoicing** of fricatives and the vowel *e*. Because some of these rules must be ordered before the FD-rules and some of them after, it is necessary to divide them into two groups of rules. Furthermore, post-FD-rules 4 and 5 form a special class of rules operative only in CA that redefine feet already defined by the FD-rules. These two rules may thus be considered a special class of **foot redefinition** rules. Nevertheless, the pre-and post-FD-rules are interrelated and best treated together for the sake of coherent presentation.

The FD-rules are presented in section 3. The typology of these rules and the prosodic feet they produce are discussed more fully in 3.1, but throughout the paper reference is made to the two major types of foot: the **accented** foot (indicated in the prosodic marking by an acute accent over the last (or only) vowel of the foot) and the **unaccented** foot. The latter is always monosyllabic and except in PWS CA, may contain only one vowel. Accented feet may be monosyllabic or disyllabic, but the number of vowels in the foot is limited to two.

Section 4 is a discussion of **accent-advancement**. In 3.3.2, FD-rule IIB is said to apply in KA where the second of three light syllables is accent-advancing. Stating the rule in this way simply obviates the question of conditioning of the rule and allows us to remove this subject to a separate section (section 4) where it may be discussed in detail without interrupting the general discussion of the FD-rules in section 3.

The rule-numbering system used here also requires comment. The PA-rules are not internally ordered, and with a few exceptions, neither are the pre-and post-FD-rules. In general, they are numbered simply for convenient reference. The FD-rules, however, are in some cases ordered with respect to one another. Since they are a more complex set of rules than either the pre-FD-rules or the PA-rules, they are numbered according to a hierarchical system (IA, IB, IC, IIA, IIB, IIC, IIIA, IIIB1, IIIB2), which I hope suggests the relationships between the rules.

Following is a summary of the rules of each category, with reference to the sections where they are presented:

PA-rules

1. Neutralization of gemination after an unaccented vowel (1.3.2)
2. Gemination after accented voiced *e* (1.3.3)
3. Vowel lengthening in an open non-final accented syllable (1.3.3)
4. Stress assignment (1.4)
5. Pitch assignment in CA (1.4.2)

Pre-FD-rules

1. Fricative dropping following a consonant (2.2.1)
2. Fricative dropping following a vowel (2.2.2.1)
3. Syllable-initial fricative devoicing in KA (2.3.1.1)

4-10. *E*-devoicing rules (2.3.2)

Post-FD-rules

1-3. Segmental adjustments due to fricative dropping following a vowel (2.2.2.2)

4. Contraction of iambic foot into accented heavy foot in CA (2.2.2.3)
   |XV.V́(C)| → |XVV́(C)|
5. Unaccented heavy foot formation in PWS CA (2.2.2.3)
   |XV̲|V(C).CV́(C)| → |XVV(C)|CV́(C)|
6. Syllable-final fricative devoicing in KA (2.3.1.2)
7. Fricative devoicing following a voiceless consonant in Kodiak KA (2.3.1.2)

FD-rules

IA. *E*-deletion (3.2.1)
   #XV.C*e* → #XVC.

IB. Automatic gemination (3.2.2)
   #XV.C → #XVC.:/__VV(C).

IC. Initial light closed foot definition (3.2.3)
   #XVC. → #XV́C|

IIA. Unaccented foot definition before a voiceless syllable in KA (3.3.1)
   |XV(C) → |XV(C)| /__C$_{\text{s}}^{\text{ɬ}}$(C).

IIB. Unaccented foot definition not before a light syllable (3.3.2)
   |XV(C). → |XV(C)| /__CVV(C). *or* __#

IIC. Unaccented foot definition before two light syllables (3.3.3)
   |XV(C). → |XV(C)| /__XV(C).XV(C). unless there is an enclitic boundary between the latter two syllables. (There are special constraints on the applicability of this rule in KA.)

IIIA. Accented heavy foot definition (3.4.1)
   XVV(C). → XVV́(C)|

IIIB1. Accented light foot definition before a voiceless syllable in CA (3.4.2)
|XV(C). → |XV́(C)| / __C̥e(C).

IIIB2. Iambic foot definition (3.4.3)
XV(C).XV(C). → XV(C).XV́(C)|

1. Sound system, syllable structure, and syllabic processes

1.1. The sound system

Systematic Alutiiq consonant phonemes are given below, with the orthographic representations in parentheses where they differ from the phonetic representations:

Stops:	p	t	c	k	k^w (kw)	q	
Voiced fricatives:		l	y	γ (g)	w~$γ^w$ (w)	ɣ (r)	$γ^w$ (rw)
Voiceless fricatives:	f	ɬ (ll)	s	x (gg)	x^w (ggw)	χ (rr)	
Voiced nasals:	m	n		ŋ (ng)			
Voiceless nasals:	m̥ (hm)	n̥ (hn)		ŋ̥ (hng)			

The symbol [:] following a consonant indicates gemination. In some Alutiiq a geminated consonant contrasts with a sequence of two identical consonants; see further 1.3.2.

For rules concerned with voicing, stops are included among the voiceless consonants. [c] (and for some older speakers also [s]) is alveolopalatal. The rounded velars are historically a labial series. /w/ is [$γ^w$] when syllable-final and, in CA, also when geminated or at the head of a non-initial heavy syllable (a syllable containing two vowels); elsewhere [w]. Also, under the same conditions in PWS CA, /y/ is [$γ^y$]. [f] is systematic only in AP KA; elsewhere [f] and [r] (*ř*) are found only in loans. In many cases, varying dialectally and even idiolectally (but especially in CA), *f* and *ř* are replaced by [x^w] (*ggw*) and *l*, respectively. In KA and older KP CA, [l^y] (and for some speakers also [r^y]) is found very occasionally in Russian loans.

In most (or at least some) Kodiak KA, the voiced/voiceless contrast for velar and uvular fricatives (i.e. the contrast between *g*, *r* and *gg*, *rr*) has become neutralized. The evidence from nineteenth century manuscripts and religious literature indicates that this contrast was still present at that time, and the contrast is still found with some speakers. In most modern Kodiak KA, however, this neutralization could be dealt with by eliminating doubled *gg* and *rr* from the orthography. The resulting mergers, written *g* and *r*, pattern like *s* and would thus be considered voiceless fricatives (see further 2.3.1.2). Compare, for example, the following words, which constitute a near-minimal pair except in most Kodiak KA:

tugarru (AP KA minus Perry, KP CA) [tu.ɣá:χu], (most Kodiak KA) [tu.xá:.χu]
'pound it to soften it'
uggatan (AP KA, some Kodiak KA, CA), *ugatan* (most Kodiak KA), both [u.xá:.tan] 'it's slanted'

In the orthography, voiceless *gg*, *ggw*, *rr* are written single or **undoubled** syllable-finally. In CA, these voiceless fricatives occur syllable-finally only before voiceless consonants. In KA, however, they are devoiced syllable-finally by post-FD-rule 6 (see 2.3.1.2) regardless of the following consonant. They are also undoubled, and voiceless nasals written without *h*, after stops and *ll* (in KA also with intervening voiceless *e*). When voiced *g*, *r* or a nasal occurs in a position where it would otherwise be interpreted as an undoubled (or *h*-less) voiceless continuant, it is separated by an apostrophe from the contiguous voiceless consonant in the orthography. Such cases are synchron-

ically or historically the result of *e*-deletion; for examples and further discussion, see 2.3.1.2 and FD-rule IA under 3.2.1. Similarly, the juxtaposition of two separate phonemes whose representation would ordinarily be taken as a digraph is indicated by separating them with an apostrophe, e.g. *n'g* [nγ] versus *ng* [ŋ]. Syllable-final /w/ ([γʷ] or devoiced [xʷ]) is represented orthographically as *ug*; syllable-final /rw/ (always devoiced [χʷ]) is represented as *ur*; and [lʲ] and [rʲ] are represented as *li* and *ři*.

The vowel phonemes are /i/, /a/, /u/, and /ə/. The first three, called **full vowels**, may cluster to form double vowels or vowel clusters. Of the resulting vowel clusters, /ai/ and /au/ are closing diphthongs in which the /a/ tends to be incompletely assimilated to the following /i/ or /u/ by raising; in KA these are approximately [ei] and [ou], and in KP CA approximately [e̝i] and [o̝u]. In PWS CA this assimilation has become complete in non-initial syllables, *ai* and *au* merging with (orthographic and phonemic) *ii* and *uu*; but interestingly, *a* in initial syllables is not at all assimilated to following *i* or *u* in PWS CA. The remaining vowel clusters are opening diphthongs in which the initial /i/ or /u/ is semivocalic.

The vowel /ə/ is a mid central vowel which cannot lengthen nor enter into vowel clusters. /ə/ can be devoiced (this phonetically represented by [ə̥]); in the orthography *e* is not normally marked as voiceless, since voicing is predictable (and sometimes variable within a dialect), but here *ę* is marked. The sequence /əγʷ/ *ęug* ([ə̥xʷ] or [u̯x]) is devoiced after a stop in AP KA alone. /əγʷ/ with voiced /ə/, however, is indistinguishable from /uγ/; the merger is written *ug*. The phoneme /χʷ/ *rw* occurs only as a voiceless fricative [χʷ]. Next to *q*, /γʷ/ is assimilated to /χʷ/ in KA, as in KA *uqrwik* [úq.χʷik], cf. CA *uqgwik* [úq.xʷik]; note also AP KA *-ciqrwet* [-ciq.χʷet], variant of *-ciq-arpet* 'Future + 1. pl.-3. sg.'. Voiceless /əχʷ/ *eur̥* also occurs in the AP KA stem /qəχʷə-/ *qęur̥e-* ([qə̥χʷ-] or [qu̯χ-], KA *qure-*, CA *qurre-*) 'to urinate'.

Vowels are uvularized before uvular consonants, which results in a distinctive type of opening and centralization, such that to the Western ear e.g. [iq] and [uq] may sound like [eq] and [oq]. Uvularized and raised [i] and [u] are, however, to be distinguished from the extrasystematic vowels [e] (written *é*) and [o] (written *ó*), found rarely in Russian loans and native interjections.

In the phonetic transcription, gemination is indicated by a colon at the head of the syllable following the geminated consonant. Syllable length is indicated by a colon following, and stress by an acute accent, over the last or only vowel of the syllable, although in the case of [ai] and [au], the [a] may perhaps more properly be considered the lengthened and stressed member. In forms cited in the orthography and prosodically marked for foot division, however, the acute accent designates an **accented syllable**, i.e. one which is subject to PA-rules 2 and 3. All such syllables are also stressed, but in KA, unaccented monosyllabic feet are also stressed (see 1.4). This difference in the significance of the acute accent in the phonetic transcription and in the prosodically marked form should be kept in mind.

1.2. Syllable structure

Alutiiq syllables have the structure XV(V)(C), where X can be zero to three consonants. Syllables containing a single vowel are called **light syllables**; those containing two full vowels, **heavy syllables**; those lacking a final consonant, **open**; and those having a final consonant, **closed**. The consonant closing a syllable, if unreleased and identical to that opening the following syllable, is called the geminate of the following consonant.

Syllable-initial consonant clusters occur only word-initially, either arising historically from **ceC* → *sC*, as in **cetaman* → *staaman* 'four', or occurring in loans (especially from Russian). Two-consonant word-initial clusters are typically either of the form *sC* or *Cř*, *Cl*; three-consonant word-initial clusters, as in *skřiipkaaq* 'violin', (Russian *skripka*) are quite rare. Other clusters, such as *gll* [xɬ] in *glliipaq* (also *lliipaq*, *kelipaq*) 'bread', (Russian *khlyeb*) are found.

In non-initial syllables, X can be either a single consonant or, in light syllables whose vowel is full, zero. Such medial vowel-initial syllables are the result of a historically and synchronically

late fricative-dropping rule, whereby initial *g, r,* and in CA also *y, w* of light syllables, may drop after a stressed open syllable, specifics depending on the dialect (see 2.2.2). Thus word-medial single consonants are always preceded by syllable division, word-medial two-consonant clusters are always separated by syllable division, and word-medial clusters of three or more consonants do not occur.

One of the distinctive phonological characteristics of the Yupik languages is the transitional interval or "space" maintained between members of consonant clusters, which may be thought of as the phonetic manifestation of the syllable boundary. Between two voiceless consonants, this transition is voiceless—a stop which closes a syllable is released with aspiration except before a voiced continuant.[3] Where one of the consonants is voiced, the transition is voiced and often manifests itself as a phonetically clear shwa-like offglide accompanying the release of the consonant, especially preceding a heterorganic consonant: breath flow accompanied by voicing is maintained as the mouth moves from one articulatory configuration to the other. It is extremely common to find these off-glides recorded as vowels in the earliest materials (although not in Tyzhnov).In Alutiiq, particularly in Chugach Alutiiq, this transition permits a contrast between lenis and fortis consonants following another consonant (see 1.3.1); the added length of fortis consonants occupies more of the transitional interval.

With geminated consonants, however, the first (syllable-final) member is not released; the oral configuration of the consonant is held across the syllable boundary. This fact has two consequences. First, there can be no distinction between lenis and fortis geminated consonants. Second, in some Alutiiq we find a contrast between a sequence of two identical consonants (the first released at syllable boundary) and a geminated consonant (not released at syllable boundary); see further 1.3.2.

1.3. Phonetic adjustments to foot structure

Prosodic feet are of two major types: the unaccented foot and the accented foot (see further 3.1). The accented foot may be disyllabic (weak-strong), in which case it is called the **iambic foot**. Thus a given syllable boundary may occur either iambic-foot-internally, before an unaccented foot, or before an accented foot. In Alutiiq we find a striking contrast in certain environments between the lenis onset of a consonant beginning a foot-internal syllable or an unaccented foot on the one hand, and the fortis onset of a consonant beginning an accented foot on the other. Although it is sometimes convenient to speak in terms of fortition of the syllable-initial consonant, or a fortis/lenis contrast, it should be emphasized that this contrast is produced by and reflected in the syllable boundary itself; the phonetic effect on the consonant is secondary.

The final (or only) syllable of an accented foot is accented. Where this syllable is open and not word-final, there operate in Alutiiq two complementary phonetic processes which serve to strengthen the syllable-lengthening of the final vowel of the syllable, and closure of the syllable with the geminate of the following syllable. These will be referred to in general as **strengthening** of an open accented syllable. It is important to note that such strengthening occurs in **all** open accented syllables and **only** in accented syllables.[4]

Thus two important phonological processes are associated exclusively with accented feet—fortition of foot-initial consonants, and strengthening of open non-final syllables. Both processes operate on the portion of the foot immediately adjacent to the boundaries of the accented foot. These processes thus set apart the accented foot as a highly marked unit and impart phonetic reality to the underlying prosodic structure of the word.

1.3.1. Fortition

The syllable boundary preceding an accented foot is phonetically similar to word boundary. Al-

[3] Sequences of stop plus voiced continuant arise only by deletion of *e* between these two consonants; see 3.2.1.

[4] Exceptional cases of long vowels in closed accented syllables are found among Russian loans. These are discussed in 1.3.4.

though these two boundary types are not always directly comparable because of distributional restrictions at such boundaries, there are cases where the similarity can be directly observed. An illustration of this which I have heard from several Prince William Sound CA speakers in support of their assertion that "a word may have more than one meaning" is the following pair of homophones:

naá|ma ciqúq [ná:.ma#ci.qúq] 'where is the plate?'
naá|ma|ciqúq [ná:.ma÷ci.qúq] 'it will suffice' or 'it will continue to burn'

These two utterances are phonetically indistinguishable in CA (except, of course, in that the speaker is free to pause between the two words in the first case). In both cases there is a slight hiatus between the syllables *ma* and *ci* accompanied by a kind of preclosure (but not gemination) of *c*, and *c* is completely voiceless. In contrast, the boundaries preceding *ci* in the pair

naá|ma cíq|uá [ná:.ma#cíq.:uá] 'where is her plate?'
naá|mací|quá [ná:÷ma.cí:÷quá] 'I will suffice'

are quite different. In the second example, there is no pause between the syllables, and *c* is somewhat voiced.

This difference in the onset of syllable-initial consonants is here referred to as **fortition** of the consonant and is represented in the phonetic transcription together with the syllable boundary as ÷C. In some (or all?) modern Kodiak KA, distinctive fortition is associated with the initial consonant of only one type of accented foot, the monosyllabic heavy foot |CVV́(C), composed of a single heavy syllable (i.e. a syllable containing two vowels, see 1.3.4). In AP KA and CA, however, fortition is associated with all types of accented feet, including the disyllabic (iambic) foot |CV(C).CV́(C), composed of two light syllables (i.e. each containing one vowel) and in CA the monosyllabic light accented foot |CV́(C) as well. Compare the following examples:

alí|kaá [a.lí:÷ká] 'she is afraid of it'
míng|qiú [míŋ÷qiú] 'sew it'
án|cí|quá (KA) [án.cí÷quá], (CA) [án.ci÷quá] 'I'll go out'
án|cí|qukút (KA) [án.cí÷qu.kút], (CA) [án.ci÷qu.kút] 'we'll go out'
akú|tamék [a.kú:÷ta.mə́k], abl. sg. of *akú|taq* [a.kú:.taq] (a food)

Systematically and phonetically, word-initial consonants are fortis. Unaccented feet do not occur word-initially; hence word-initial consonants must begin an accented foot and are considered fortis. This is not explicitly represented in the phonetic transcription. Furthermore, geminate consonants are not phonetically distinguishable as lenis or fortis, i.e. *[C÷:] is not distinguishable from [C.:] (see further 1.2 and 1.3.2). Elsewhere, an accented foot-initial consonant is indicated in the phonetic transcription as fortis, although, as we have mentioned, in some environments this fortition may not be phonetically perceptible, and in (some) Kodiak KA distinctive fortition of iambic foot-initial consonants does not occur.

Fortition is a phonetically complex phenomenon. We may note two major distinguishing characteristics of the fortis consonant: complete lack of voicing with voiceless consonants (stops and voiceless fricatives), and preclosure. The degree to which fortis and lenis variants differ varies according to the manner of articulation of the consonant and its phonetic environment.

Fortition is phonetically most prominent with a voiceless consonant following a voiced segment. Here a fortis consonant is wholly voiceless and somewhat tense, whereas lenis stops and *s* (and in PWS CA also the other voiceless fricatives) are semivoiced and lax. This fact is abundantly reflected in Russian transcriptions of Alutiiq words and later in anglicized "phonetic" spellings by Alutiiq speakers.

We are especially fortunate to have a sizeable corpus of textual material from the 1840s, from Kodiak KA, printed in a phonologically very informative orthography, by Elias Tyzhnov working in collaboration with the Alutiiq speakers Gerasim Zyrianov and Vladimir Uchilishchev, on the basis of which we can also document both stability and significant historical changes, inasmuch as his transcription allows us to infer prosodic phenomena. In Tyzhnov's translations of religious literature, we usually find *d, g, ź* for lenis *t, k/q, s* following a voiced segment, alongside *t, k, ś* elsewhere.[5] Note that although fortition of the initial consonant of an iambic foot does not occur in most modern Kodiak KA, Tyzhnov's transcriptions imply that such fortition occurred in at least one dialect of 19th century Kodiak KA. One striking example is his consistent use of *g* in *taugút* (*taú|kut*) 'those', but *k* in *taukuni* (*taú|kuní*) 'in those' and similar forms throughout (e.g. Matthew 4:3 and Matthew 3:1). Other examples are readily found, such as *aŭákudaḱ* for *awá|kutáq* 'son' (implying fortis *k* and lenis *t*, Matthew 1:21). However, exceptions to these generalizations are also common in Tyzhnov's transcriptions, evidently for the sake of morphological consistency, such as *aŭakúta* for *awá|ku|taà* 'his son' (with *k* for lenis *k*, Matthew 1:20) and *aludamýn* for *alú|tamén* 'into the dish' (with *d* where fortis *t* is expected, Matthew 26:23), consistent with *alúdam* for *alú|tam* 'of the dish' (Matthew 23:25). Compare, however, *ļakamýn* for *laá|kamén* 'into a pit' (Matthew 15:14), where a form such as **lágaḱ* for *laá|kaq* 'pit' does not occur in the corpus, so that analogical levelling does not occur in Tyzhnov's spelling. Note that when these consonants begin a heavy syllable they are, without exception, written with the voiceless alternant (cf. *aŭákudaḱ* and *aŭakúta* above. Thus, while Tyzhnov may use a voiced consonant at the head of an iambic foot by analogy with another form of the word, this does not occur at the head of a heavy syllable. Compare further *tanǧiḱ* for *tán|qik* 'light' and *tanǧimýḱ* for *tán|qiméḱ* 'from light' (both from the Creed) with *taŋḱ'và* for *tán|qiá* 'its light' (Matthew 5:14).

Lenis consonants following voiced segments differ most radically from fortis consonants in the Prince William Sound subdialect of CA, where lenis stops may become so loosely articulated as to sound virtually like voiced fricatives. Since at the same time the voiced fricatives in the same position have also weakened, no merger has taken place between the stops and the fricatives. (This phonetic lenition might eventually have achieved morphophonemic status (as in Bering Strait Inupiaq), whereby *k, q* would alternate with *g, r*, and *g, r* with zero; but we see no synchronic motivation yet for such rules.) Lenis intervocalic voiced fricatives (except *l*) are usually dropped by pre-FD-rule 2 (see 2.2.2.1) except in the position #XV.__V(C)., where *g* and *r* in particular are very weakly articulated in PWS CA. Thus in the pair of words *iquka* 'my end' and *iruka* 'my leg', *q* is a loosely articulated voiced stop (easily mistaken for *r*), whereas *r* is a weak voiced fricative, almost a glide. Syllable-final voiced *g, r* also tend to be likewise weakened in PWS CA, so that the onset of a following consonant can usually be distinguished clearly as lenis or fortis.

The phonetic difference between fortis and lenis onset of a consonant is much less apparent following a closed syllable than following an open syllable (and particularly a syllable closed with a voiceless consonant). In KA, it is not at present clear if any phonetic distinction exists except in the case of syllable-final *l, ŕ*, or a nasal followed by a stop, where at least the voicing contrast may be observed.

Following a vowel, and in careful speech in CA (particularly in PWS CA) also following a consonant, the onset of a fortis consonant is phonetically characterized by the sort of hiatus noted above in the syllable boundary between *ma* and *ci* of *naamaciquq*. At the syllable boundary, air pressure is suddenly reduced to produce a gap in breath flow (more obvious following a voiced segment than following a voiceless segment) during which the mouth also assumes the configuration of the consonant. A fortis consonant is thus longer in duration than its lenis counterpart and occupies a greater portion of the transitional interval between syllables. Thus in deliberately exaggerated pro-

[5] Tyzhnov surprisingly does not record lenis *p* as *b*, however. Perhaps he was simply adhering to Veniaminov's orthographical system for Aleut, which at that time conspicuously lacked *b*. In biblical names and other lexical items artificially borrowed for religious translations, *w* was regularly substituted for *b* as well as for *v*.

nunciation by KP CA speakers, one may hear the shwa-like transition (see 1.2) between *n* and *q* in *tanqik* but not in *tanqia*, where the fortition of *q* occupies most of the syllable boundary.

We have already noted that in most modern KA, distinctive fortition is phonetically apparent at the beginning of the accented heavy foot |CV́V(C) but not the iambic foot |CV(C).(C)V(C), and that Tyzhnov in the former case always transcribes the initial consonant as voiceless, but in the latter case may transcribe the initial consonant as voiced by analogy with another form of the word where the consonant is lenis. Even in AP KA and CA, where fortition occurs in both cases, preclosure of the initial consonant of the iambic foot may not be as pronounced as that of the accented heavy foot. For example, comparing the words

taá|taqá [tá:ˑta.qá] 'my father'
taá|taá [tá:ˑtá] 'her father'
maá|maqá [má:ˑma.qá] 'my mother'
maá|maá [má:ˑmá] 'her mother',

with most Kodiak KA speakers, the *t* and *m* of *taataqa* and *maamaqa* are not distinctively fortis. Elsewhere, although the *t* of *taataqa* is fully voiceless and preclosed and thus distinctively fortis, preclosure of the *m* of *maamaqa* is less distinct, and may not be audible in AP KA. In the case of *taataa* and *maamaa*, however, preclosure is distinctively audible in all dialects.

Again, comparing

kús|kaqá [kús̊ˑka.qá] 'my cat'
kús|kaá [kús̊ˑká] 'her cat',

k is voiceless because it follows a voiceless segment, and the preclosure of *k* is phonetically problematic, being in a fully voiceless environment. Here preclosure is inaudible in the case of *kuskaqa*, but in *kuskaa* one may detect that the *k* is slightly longer and tenser, especially in the careful speech of CA speakers.[6] It thus seems best to view fortition as a *potential* phenomenon, associated with the foot boundary: under the right circumstances it appears on the phonetic surface, especially at the head of a heavy syllable; elsewhere it may be latent.

Preclosure associated with a fortis consonant is impressionistically similar to gemination, but differs from it in that whereas the geminate of a following consonant closes the syllable, the preclosure associated with a fortis consonant must be considered to belong to the syllable headed by the fortis consonant or to the syllable boundary itself, since fortis consonants can occur following closed syllables and three-consonant clusters are not allowed (see further note 32). A three-way contrast between lenis, fortis and geminated consonants is moreover possible following an accented vowel:

[6] The case of fortis *y* and *w* is especially complex. In KA and KP CA fortition is not detectable except at the head of a heavy syllable. As pointed out in 1.1, fortis *w* in CA and *y* in PWS CA have special allophones ([ɣʷ] and [ɣʲ]) at the head of a heavy syllable (as well as when syllable-final and when geminated). These allophones are **not** otherwise found where the foot structure predicts a fortis consonant, i.e., at the head of a word or of an iambic foot. Compare, for example:

waá|muq [wá:ˑmuq] 'she is playing'
nán|wami [nán̊ˑwa.mí] 'on the lake'
nán|waá [nán̊ˑɣʷá] 'its lake'

We should also note that accented feet beginning with vowel-initial syllables as a result of fricative dropping (see 2.2.2) show no phonetic trace of fortition; the dropped consonant is simply gone. In PWS CA, however, post-FD-rule 5 (see 2.2.2.3) provides an interesting partial solution to the theoretical issue here. The vowel-initial syllable is grouped with a preceding monosyllabic unaccented foot to form an unaccented heavy foot. The following syllable is defined as an accented light foot, so that its initial consonant is fortis; hence, in effect, the consonant of the following syllable assumes the fortition which would otherwise accompany the dropped fricative.

mulúk|'uút (KA, CA) [mu.lúk.:út] 'milks' (plural of 'milk')
mulú|kuút (KA, KP CA) [mu.lú:ᵗkút] 'if you take a long time'
mulú|kan (KA, KP CA) [mu.lú:.kan] 'if she takes a long time'
(where *k* is semi-voiced)

The lengthened *u* in *mulukuut* is truncated, i.e. shorter than that of *mulukan* because of the hiatus associated with the onset of the accented syllable (indeed, in some KA it is difficult to distinguish such truncated lengthened vowels from short vowels; see further 1.3.5). This difference in length is not indicated in the phonetic transcription (but may readily be inferred from the presence of ᵗ following V:). Thus we see on the surface phonetic level three lengths of vowels and three inversely corresponding "lengths" of consonants.

1.3.2. Gemination

Geminated consonants are ambisyllabic; that is, they close the first of two contiguous syllables and begin the second. It should be noted that in PWS CA and in some KA, including Perry KA (as also in HBC CY), a geminate consonant is not the same as two identical consonants. In these Alutiiq varieties we find contrasts such as the following, where the geminate consonant is unreleased, whereas the identical consonant is released, as discussed in 1.2.

úl|'uq (CA, KA outside Perry) [úl.:uq], *úll|'uq* (Perry KA) [úɬ.:uq] 'it flooded'
úl|uá (CA, KA outside Perry) [úl.:uá], *úll|uá* (Perry KA) [úɬ.:uá] 'its tongue'
úl|'luní (PWS CA) [úlᵗɬu.ní], (Perry KA) [úɬᵗɬu.ní]; *úl'uní* (KP CA, some Kodiak KA) [úl.:u.ní] 'flooding'

As seen from the above examples, lexically or morphologically assigned gemination is orthographically indicated by an apostrophe after the geminated consonant (except in the environment #XV__VV, as in *ulua*; see FD-rule IB under 3.2.2). Devoicing in the Perryville examples is due to pre-FD-rule 3 and post-FD-rule 6 (see 2.3.1). The above example furthermore illustrates that whereas the second of two consonants is (at least sometimes) phonetically distinguishable as lenis or fortis, the release of a geminated consonant is not; otherwise the second *l* of *ul'uq* would be lenis and that of *ulua* would be fortis.

Gemination may be non-phonologically (lexically or morphologically) assigned or phonologically assigned (generated by pre-FD-rule 1 [see 2.2.1], FD-rule IB [see 3.2.2], or by PA-rule 2 [see 1.3.3 below]). An important distributional restriction on gemination is that it may occur only following an accented vowel.

PA-rule 1. *Gemination is neutralized following an unaccented vowel; that is, [:] occurs only following an accented foot.*

Compare the following forms containing the postbase *-n'ir-* (CY *-nrir-*) 'stop V-ing':

atún|'irtúq [a.tún.:iɣ.túq] 'he stopped singing'
íq|llunír|tuq (KA) [íqᵗɬu.níɣ.tuq], *íq|llu|nirtúq* (CA) [íq.ɬuᵗniɣ.túq] 'he stopped lying'
akú|ta(r)tún|'irtúq (KA) [a.kú:ᵗta(ɣ).tún.:iɣ.túq], *akú|ta(r)|tunír|tuq* (CA) [a.kú:.ta(ɣ)ᵗtu.níɣ.tuq] 'he stopped eating *akutaq* (a food)'

1.3.3. Strengthening of accented syllables

As discussed in 1.3, there are two complementary processes which serve to strengthen open

non-final accented syllables in Alutiiq—gemination of the following consonant and vowel lengthening. Gemination of C in the sequence #XVCVV is accomplished by FD-rule IB (see 3.2.2). This results in the syllable structure #XVC|:VV, so that #XVC is defined as a monosyllabic accented foot by FD-rule IC. Elsewhere, strengthening of open non-final accented syllables is accomplished by the rules given below.

Accented *e* is generated exclusively by FD-rule IIIB2, which defines iambically accented disyllabic feet (see 3.4.3). Iambic accent on syllables containing voiceless *e* is avoided in CA by FD-rule IIIB1 (see 3.4.2) and largely avoided in KA by FD-rule IIB (see 3.3.2 and 4.3.2). If the vowel of the iambically accented open syllable is voiced *e*, however, then the following rule applies:

> **PA-rule 2.** *An accented open syllable whose vowel is voiced* e *is closed with the geminate of the following consonant.*

úm|yuár|te|quték|aqá (CA) [úm˗yuáɣ.tə˗qu.tə́k.:a.qá] 'I'm thinking about it'
pisúr|pe̯kén|ii (AP KA) [pi.súɣ.pə̯.kə́n.:í] 'without my hunting'
Agá|yutém|aang (KA) [a.ɣá:.yu˗tə̄m.:áŋ] 'O my God' (vocative)

Where the open accented syllable contains a full vowel or a vowel pair (i.e. vowel(s) other than *e*), however, the syllable is strengthened by lengthening of the vowel or vowel pair. It should be noted in this connection that phonological (and orthographic) pairing of vowels does not imply length but rather a more abstract feature called **syllable weight**, which will be discussed in the following section. Thus both *a* and *aa* can represent [a] and [a:], and *ai* can represent (short) [ai] and (long) [ai:].

> **PA-rule 3.** *The vowel or vowel pair of an accented syllable is phonetically short if the syllable is closed or word-final, and long if the syllable is open and not word-final, unless the vowel is* e. *(Exceptional cases of long vowels in closed syllables found in loan words are discussed below in 1.3.4.)*

qayá|kun [qayá:.kun] 'by boat'
qayát|gun [qayát.xun] 'by boats'
qáy|aá [qáy.:á] 'his boat'
qáy|aá|kun [qáy.:á:.kun] 'by his boat'
qáy|aát [qáy.:át] 'their boat'
qáy|aát|gun [qáy.:át.xun] 'by their boat'

In the last four examples, *y* is geminated by FD-rule IB (see 3.2.2).

1.3.4. Syllable weight

In Inupiaq, the phonetic difference between phonologically single and double vowels is relatively simple to describe: single vowels are short and double vowels are long. In Yupik, however, single full vowels in open accented non-final syllables are lengthened (in CY this is called iambic lengthening), so that the correspondence between phonological length and phonetic length is no longer direct. In Alutiiq, furthermore, double vowels in closed or final syllables are phonetically short. In fact, phonetic length has become largely redundant, being predictable by prosodic accentuation, closure, and position of the syllable in the word. This is the reason for choosing the terms "light" and "heavy" rather than "short" and "long" to denote whether a syllable has one or two vowels.

In native Alutiiq words, the vowel pair of an accented heavy syllable is phonetically short if

the syllable is closed or word-final, and long if the syllable is open and not word-final.* The same generalization, however, is true of single accented full vowels. Thus vowel length for either type of accented syllable can be described by PA-rule 3 above. The process whereby a historically long vowel pair is shortened in a closed syllable is called **compression**; this phenomenon is also found in HBC and Nunivak CY (see Jacobson, this volume).

Because the length of both light and heavy accented syllables containing full vowels is determined by PA-rule 3 above, and since all accented syllables begin with fortis consonants, it is phonetically impossible in Alutiiq to distinguish a heavy syllable which forms a heavy foot from an otherwise homophonous light syllable which forms a monosyllabic accented foot, as for example *taá* from *tá*, *taát* from *tát*, or *kuá* from *kwá*. Non-initially, monosyllabic light accented feet arise only in restricted environments because of the operation of FD-rule III B1 and post-FD-rule 5 in CA (see 3.4.2 and 2.2.2.3) and have not been found in KA. Furthermore, in the case of rule 5, the monosyllabic light accented foot occurs in an environment where a heavy foot is not allowed. Thus only FD-rule III B1 produces instances where it is not possible to determine phonetically whether a non-initial syllable is heavy or light.

The weight of word-initial closed syllables containing full vowels, however, is phonetically problematic in both KA and CA. FD-rule IC defines an initial closed light syllable as an accented foot, and FD-rule IIIA defines a heavy syllable as an accented foot. Thus an initial closed syllable, whether phonologically light or heavy, begins with a fortis consonant and contains a phonetically short vowel or vowel cluster, according to PA-rule 3, so that phonetically short *a*, *i*, *u* of a closed accented word-initial syllable could reflect a phonologically single or double vowel. Where the initial syllable is open, however, it will be accented and hence long if heavy, but unaccented if light. Thus, for example, the syllable weight of the underlying stems *naaqe-* 'read O' and *taqe-* 'become finished' are distinguishable where the initial syllable is open, e.g. in the so-called non-witnessed subordinative forms (from CA; see 4.2.2.1):

naa|qu|ma|lú|ku [ná:.qu˧ma.lú:.ku] 'apparently reading it'
taqú|ma|luni [ta.qú:.ma˧lu.ní] 'apparently getting done'

but not where the initial syllable is closed, e.g. in the subordinative forms:

náq|lluku [náq˧ɬu.ku] 'reading it' (underlyingly *naaqlluku*)
táq|lluni [táq˧ɬu.ni] 'getting done' (underlyingly *taqlluni*)

Because of this, a special orthographic convention has been established for initial syllables in Alutiiq: if the syllable vowel is phonetically short *a*, *i*, or *u*, the vowel is written single; if long, the vowel is written double. A vowel pair composed of different vowels, however, is written the same whether phonetically short or long.

The rule given above for predicting vowel length works for all native Alutiiq words, but exceptions are not uncommon in loan words, where long closed syllables may be found. When these occur in initial syllables, the vowel is written double according to the special orthographic rule just mentioned. Elsewhere, we resort to an acute accent over the long vowel:

paankaaq [pá:n˧káq] 'can'
palátkaaq [pa.lá:t˧káq] 'tent'
ciggiiunkaaq [cix.:ú:n˧káq] 'tuberculosis'

* The unaccented heavy syllable, which occurs only in PWS CA, is a special case which results from the contraction of two light syllables. The open unaccented heavy syllable appears to be identical in length with an open accented heavy syllable, but a closed unaccented heavy syllable is longer than a closed accented heavy syllable (see 2.2.2.3 for examples).

1.3.5. Indeterminacy of syllable weight in Kodiak KA

In Kodiak KA, several phonetic tendencies appear to collaborate to produce neutralization of weight contrast in a certain environment (the expected contrast, if not completely neutralized, is certainly very hard to hear, and speakers do not exhibit awareness of a potential contrast when I try to elicit one). With most Kodiak KA speakers I find it impossible to distinguish weak stress (characteristic of the monosyllabic light foot) and strong stress (characteristic, e.g., of the heavy foot). Likewise, for these same speakers, I cannot judge whether accentual lengthening is operating on an open syllable foot or a voiceless unaccented foot; the length contrast is indeterminate here. The combination of these factors obscures the stress-lengthening contrast which allows us to distinguish the rime of an unaccented foot (CV(C)|) from that of a heavy foot (CVV(C)|, where the vowels are identical) before an accented foot or a voiceless unaccented foot. Where the syllable in question cannot be tested, i.e. where it is an inner syllable of an unanalyzable morpheme, this indeterminacy makes it impossible, without recourse to speakers from dialects other than Kodiak KA, to ascertain how a word should be spelled. For example, with the stem *kanáp'a(á)tiir-* [ka.náp.:á(:)ᵀtíɣ-] 'to caulk', phonetic stress and length are indeterminate—and these are the very properties that would allow us to ascertain the syllable weight. (In CA, this stem and similar stems have a double vowel.) There are more than a few cases like this in the lexicon, chiefly borrowings from Russian, but some are native, e.g. *ág|qa(á)cɣstaár-* [áx.(ᵀ)qá(:).cɣ̣s.(ᵀ)táɣ̣-] 'to tease'.

Not all such cases are indeterminate, however, for if the preceding foot ends in an open syllable, the presence or absence of fortition at the head of the syllable in question allows us to determine syllable weight. In the two cases above, the fortition is indeterminate.

An example of a morpheme whose syllable weight is often indeterminate in Kodiak KA is *+taar-* ('habitual', corresponding to CA *+lar-*). We can compare this postbase with *+tar-* 'to fetch N', choosing examples like

nér|taár|tukút [nə́ɣ̣ᵀtáɣ̣ᵀtukút] 'we (always) eat'
mér|tar|tukút [mə́ɣ̣.táɣ̣ᵀtukút] 'we fetch water'

nér|taá|qumá [nə́ɣ̣ᵀtá(:)ᵀqu.má] 'if I (always) eat'
mér|ta|qumá [mə́ɣ̣.táᵀqu.má] 'if I fetch water'

nér|taá|qan [nə́ɣ̣ᵀtá:.qan] 'if she (always) eats'
mér|taqán [mə́ɣ̣ᵀta.qán] 'if she fetches water'

It is only in the last pair that the underlying contrast in vowel weight is phonetically verifiable (due to the obvious difference in foot structure and vowel length). In the first two pairs, however, the theoretical contrasts in syllable-initial fortition, stress (see 1.4.1), and (in the second pair) vowel length before a fortis consonant, are neutralized on the phonetic surface. We can also provide examples where the fortition is phonetically obvious and confirms that this postbase consists of a heavy syllable, e.g. *initaarai* [i.níᵀtá(:)ᵀɣ̣ái] 'he (always) hangs them' and *aqgwataarai* [áq.xʷaᵀtá:ᵀɣ̣aí] 'he (always) goes to get them'.

In spite of the indeterminacy in Kodiak KA illustrated here, the phonetic transcriptions in this paper reflect the distinctions predicted by the PA rules, and thus, to some degree, "improve on" the phonetic reality. Nevertheless, these admittedly subtle distinctions are found in Alutiiq as a whole.

1.4. Stress and pitch

In this paper, a distinction is made between phonetic **stress** and prosodic **accent**. In CA stress coincides with prosodically assigned accent, but in KA the unaccented foot is also phonetically stressed. In the prosodically marked forms given here the acute accent represents prosodic accent, but in the phonetic transcription it represents stress. Since the notation for pitch is cumbersome, it is not usually indicated except in this section. It should also be noted that voicelessness precludes

overt phonetic stress and pitch.

In both KA and CA, word-final accented feet have two variants: a **stressed** form in which the word-final accented syllable is distinctly stressed and pitch is elevated as with non-final accented syllables, and a **destressed** form in which the word-final accented syllable is destressed (or at least the stress is not so obvious) and pitch is lowered.* The stressed variant of the word-final foot is found mainly in connected speech and before a "thinking" pause (i.e. where the speaker has not yet completed the utterance), and the unstressed variant is found utterance-finally, although the stressed form may be used here as an intonational variant denoting surprise, questioning, or emphasis. In this paper, final accented syllables are uniformly marked as stressed.

> **PA-rule 4.** *Stress is assigned to accented syllables, and in KA also to non-final unaccented feet. Word-final accented syllables are optionally destressed.*

1.4.1. Stress and pitch in KA

Only a few general observations about stress and pitch are reliable enough to be considered prosodically useful. The initial syllable of an iambic foot is unstressed and low in pitch relative to the second (accented) syllable of the foot. Prosodically accented syllables are fully stressed except word-finally, where they may be destressed, depending on discourse factors.

Light syllables that are defined as unaccented feet (by FD-rules IIIA and IIIB2, see 3.4) are stressed and sometimes higher in pitch than the accented syllables of adjacent accented feet. The degree to which unaccented feet are stressed and high-pitched is variable in KA. With some speakers, it seems possible to detect a subtle difference in the degree or type of stress proper to an unaccented foot; the stress seems weaker than that of a neighboring accented foot, even when that foot's pitch is higher than that of the accented foot. Perhaps it is more accurate to say that the stress varies from weaker than to roughly equivalent to that of the accented foot, depending on discourse factors. With other speakers, particularly in Kodiak KA, it is difficult to determine whether such degrees of stress exist. It seems likely that acoustic analysis of this matter could produce interesting results, since the recording instrument presumably would not be troubled with the tendency of the human observer to equate higher pitch with greater stress.

As noted above, word-final accented syllables may be destressed. Destressing typically occurs at the end of a connotatively neutral utterance. Where some connotative feature, such as emphasis, incredulity, or questioning is present, destressing typically does not occur. Failure to destress may also imply that the speaker is still mentally composing what he is about to say. Hence, destressing generally implies that the speaker is finished with a thought and is implying nothing more. Destressed accented syllables are usually not completely devoid of stress; one might say that the stress is muted and the pitch lowered. This is especially true of destressed heavy syllables, apparently since stress is diagnostically important in determining syllable weight.

Pitch in KA is for the most part unremarkable and is here described without recourse to assigning numbered pitch levels. Initial and final unstressed syllables are low in pitch, as are destressed final accented syllables. Stressed and word-internal unstressed syllables tend to be medium in pitch, but some speakers tend to elevate the pitch of the non-final unaccented foot above that of contiguous syllables. This is particularly true where an unaccented foot precedes a destressed word-final accented foot.

* In Perryville and PWS CA I furthermore found that the destressed form of a word-final iambic foot may be emphasized by imposing weak stress and elevated pitch on the **first** syllable of the iambic foot. The phonetic result [(C)V́(C).(C)V(C)] is thus identical with a word-final sequence of two unaccented feet (not otherwise found in Alutiiq because of the prosodic constraint against such a sequence [see 3.1]). Such **emphasized destressed** alternants of iambic feet are difficult to characterize precisely, because speakers do not attach any difference in meaning to such stylistic variation. Attempts to isolate and discuss these discourse variants by elicitation were futile. Infrequently I noted striking spontaneous examples of this phenomenon, yet was unable to determine what motivated it.

PA-rule 5. *Stress in KA is assigned to prosodically accented syllables, except optionally word-finally, where such syllables may be destressed. In KA, non-final (monosyllabic) feet are also weakly stressed and may tend to be higher in pitch than contiguous syllables.*

1.4.2. Stress and pitch in CA

Stress in CA corresponds simply to prosodic accent. As in KA, word-final accented syllables may be destressed and lowered in pitch, but the accent is nevertheless felt to be present even where not phonetically prominent.

CA pitch seems acoustically quite flexible in comparison with other Eskimo languages and KA. The amount of word-internal fluctuation in pitch gives the impression that pitch is a comparatively important phonetic feature of this dialect. However, CA pitch assignment is quite regular and can be simply described. There are three pitch levels, 1 being the lowest and 3 the highest. These levels are indicated in this section by superscript numbers.

PA-rule 6. *Stress in CA coincides with prosodic accent, except that word-final accented syllables may optionally be destressed. Pitch in CA is assigned as follows:*

a. *No pitch is assigned to the initial syllable of a word-internal disyllabic iambic foot.*

b. *Otherwise, level 1 is assigned to an unstressed syllable, i.e. the initial syllable of a word-initial disyllabic iambic foot, and to a syllable defined as an unaccented foot (and in PWS CA also to both syllables of a disyllabic unaccented foot).*

c. *Level 2 is assigned to a stressed syllable following either word boundary or an unstressed syllable of level 1.*

d. *Level 3 is assigned to a stressed syllable following a stressed syllable of level 2, and level 2 to one following a stressed syllable of level 3. In both cases there may be an intervening syllable of unassigned pitch (see* (a) *above).*

e. *The initial syllable of a word-internal disyllabic iambic foot, not assigned a pitch level by the preceding rules, is roughly intermediate in pitch between the preceding and following syllables.*

f. *A final minor rule is that destressed final syllables are lowered to level 1.*

Pitch assignment on a series of accented feet by subrule (d) is quite interesting when compared to the case where an unaccented foot intervenes between the accented feet.

ág'|^{2}*ku*|^{1}*tartú*|^{2}*ten*^{1} 'you're going to go'
ág'|^{2}*kutár*|^{3}*tuá*|^{2}*nga*^{1} 'I'm going to go'

ág'|^{2}*nguá*|^{3}*qu*|^{1}*tartú*|^{2}*ten*^{1} 'you're going to dance'
ág'|^{2}*nguá*|^{3}*qutár*|^{2}*tuá*|^{3}*nga*^{1} 'I'm going to dance'

ág'|^{2}*nguá*|^{3}*ruá*|^{2}*qu*|^{1}*tartú*|^{2}*ten*^{1} 'you're going to pretend to dance'
ág'|^{2}*nguá*|^{3}*ruá*|^{2}*qutár*|^{3}*tuá*|^{2}*nga*^{1} 'I'm going to pretend to dance'

In the first example of each pair, a series of three light syllables is defined as an unaccented foot, followed by a disyllabic (iambic) accented foot to which subrule (c) applies. In the second, the series of two light syllables is defined as an accented foot. Since there is no intervening unaccented foot here, subrule (d) continues to apply.

Examples of the optional destressing of final accented syllables:

ág|²luní³ **or** *ág|²luní¹* 'going'
ág|²nguár|³luní² **or** *ág|²nguár|³luní¹* 'dancing'

2. Phonological processes related to the prosodic rules

2.1. Pre- and post-FD-rules

The pre- and post FD-rules both deal with two important phonological processes in Alutiiq: fricative dropping and devoicing of fricatives and the vowel *e*. Considerable dialect variation is found in the rules. Fricative devoicing is confined to KA and is most highly developed in Perry KA. Devoicing of *e* is also more prominent in KA, and least so in PWS CA. Fricative dropping, by contrast, is most highly developed in PWS CA and least so in GAP KA. Thus, traveling eastward, we find (roughly) progressively less devoicing and more fricative dropping.

There is moreover a typological relationship, albeit an imperfect one synchronically, between fricative dropping and fricative devoicing in KA. Both processes are in some way related to consonant strength. In KA, fricatives which devoice do so when geminated or at the head of a heavy syllable (where they are fortis); however, where they head a disyllabic accented foot, also called an iambic foot (where fortition is also the rule), they are not affected by devoicing. Following a vowel, as a rule these fricatives are dropped, unless they are devoiced, but following a consonant, they are usually not dropped. It is thus difficult to draw a synchronically clear parallel between some abstract concept of consonant strength and these processes. Historically, however, such a relationship no doubt exists.[9]

2.2. Fricative dropping

The dropping of certain voiced fricatives (especially *g* and *r*) is a productive phonological process found to some extent in all Alutiiq. Such dropping usually occurs where the voiced fricative heads a light syllable (i.e. precedes a single vowel). Voiceless fricatives, although they sometimes drop after consonants, do so less frequently, and occasionally fricative dropping occurs after a consonant and before a vowel pair. In such cases dropping is not describable in terms of regular phonological rules but must be treated lexically. The conditions under which fricative dropping takes place vary dialectally. Fricative dropping is least frequent (and often optional) in GAP KA, more frequent and regular in Perry and Koniag KA and KP CA, and most highly developed in PWS CA—thus the development of fricative dropping forms, synchronically, a somewhat irregular continuum from west to east.

Fricative dropping may occur following a consonant, where it is replaced by gemination of the preceding consonant, or following a vowel, where the dropping of the fricative results in a vowel-initial syllable. Happily, both these results can be represented in the orthography by the apostrophe, which may then be taken to "represent" the dropped fricative. It should be understood that the apostrophe does not represent a glottal stop or any articulatory modification of the preceding sound. In some environments it may still correspond to the beginning of a new breath pulse; this has not been thoroughly researched. For example, the syllable boundary in a sequence such as *á'a* is phonetically imperceptible (at least in CA) except as a fall in pitch; such sequences must nevertheless be taken prosodically as disyllabic in order to determine the correct result of stress assignment.

Bases and postbases ending in XV(C), where X is a fricative which can drop, have two var-

[9] The historical connection can be outlined briefly here. Devoiced fricatives and dropped fricatives historically developed from allophones of voiced fricatives that were articulated with respectively greater and less approximation of the organs of articulation. The more approximate allophone, which occurred in geminate consonants, at the head of a heavy syllable and probably also syllable-finally, was truly fricative, i.e. like a voiceless fricative except for voicing. The less approximate allophone, which occurred elsewhere, was virtually a sonorant; *g* and *r* in particular were quite loosely articulated. Such is the case in present-day PWS CA (see 1.3.1) and AP KA. The allophony described here is still found in CA with *w* and in PWS CA with *y*, whose more approximate allophones are [γ^{w}] and [γ^{y}] (see 1.1).

iants: where X precedes a single vowel, it drops yielding a stem variant without X; but where suffixation results in a vowel pair following X, X is retained. Hence we find morphological alternants, orthographically of the form ...C'V(C)...~...CXVV... and ...V'V(C)...~ ...VXVV..., where the apostrophes represent gemination and syllable division respectively, e.g. CA

kam'uk 'shoe'	*uyu'aq* 'younger brother'
kamgua 'her shoe'	*uyuraa* 'his younger sibling'
stem *kamgug-*	stem *uyurar-*

In such cases it is not necessary to designate the disappearing fricative as a special morphophoneme, because of the regularity of the dropping rules.[*] In other cases, however, fricative dropping occurs in bases and postbases where there is no possibility of adding a suffix resulting in a vowel cluster after the fricative, so that the dropped fricative never appears overtly. In virtually all cases, however, the identity of the dropped fricative can be established by either internal (morphological) or external (dialectal) comparison.

2.2.1. Fricative dropping following a consonant

Fricative dropping following a consonant as a productive phonological process is confined to Perry KA and CA. In CA it occurs regularly where voiced *g* and *r* begin a light syllable. In Perry KA, it occurs regularly where voiced *r* begins a light syllable; voiced *g* beginning a light syllable, however, is sometimes dropped and sometimes not. It has not been determined whether there are regular conditioning factors or whether dropping of *g* is lexically marked in Perry KA. In Kodiak KA and GAP KA, such fricative dropping occurs but is not phonologically productive and thus is lexically marked.

> **Pre-FD-rule 1.** *In CA and Perry KA, voiced* g *or* r *beginning a light syllable and following a consonant is replaced by gemination of the preceding consonant. With voiced* g, *this rule does not always apply in Perry KA.*

qán|ra (GAP and Kodiak KA) [qán.ɣa], *qán|'a* (Perry KA, CA) [qán.:a] 'its mouth', from *qaneq* 'mouth'

ím|gak (GAP and Kodiak KA) [ím.ɣak], *ím|'ak* (Perry KA, CA) [ím.:ak] 'he rolled them (2) up'; compare *ím|gaá* (KA) [ím˞xá], (CA) [ím˞ɣá] 'he rolled it up'

mál|ruk (GAP KA) [mál.ɣuk], *máll|'uk* (Perry KA) [máł.:uk], *mál|'uk* (Kodiak KA, KP CA) [mál.:uk] 'two'; compare *mál|ruát* (GAP and Kodiak KA) [mál˞χuát], (KP CA) [mál˞ɣuát], *máll|ruát* (Perry KA) [máł˞χuát] 'the second (of more than 2)'

Note that in Perry KA, geminated *l* is devoiced by pre-FD-rule 3 (see 2.3.1.1). The gemination can subsequently be neutralized by PA-rule 1 (but the devoicing remains):

nuú|nilgú|riúq (GAP KA) [nú:˞nil.ɣú:˞χiúq], *nuú|nillú|riúq* (Perry KA) [nú:˞ni.łú:˞χiúq] 'there are getting to be a lot of porcupines'

In the following example, *g* is not dropped in Perry KA and is devoiced in GAP and Kodiak KA by post-FD-rule 7.

[*] An exception is y in KP CA, which may or may not drop intervocalically and therefore must be lexically marked for dropping (see pre-FD-rule 2 under 2.2.2.1).

it|'*gaq* (Perry KA) [ít.ɣaq], *it*|*gaq* (GAP and Kodiak KA) [ít.xaq], *it*|'*aq* (CA) [ít.ːaq] 'foot'; compare *it*|*gaá* (KA) [ít˞xá], *it*|'*gaá* (CA) [ít˞ɣá] 'its foot'

Gemination from fricative dropping may become lexicalized so that the dropped fricative does not reappear where contraction results in a following vowel pair, as in the case of the postbase *-n'ir-* 'stop V-ing', which in combination with the so-called non-witnessed suffix is *-n'iuma-* for most speakers, rather than the expected *-nriuma-* (see further 1.3.2). Moreover, fricative dropping following a consonant occurs in certain lexicalized cases where the fricative is voiceless or heads a heavy syllable. Such cases are seldom found in KA and KP CA but more frequent in PWS CA, where *llr* → *ll'* is common. Examples are the 3.sg. participial and past tense ending (KA) *-llria* (also found as *-ll'ia* in some Kodiak KA), (KP CA) *-lraa*, (PWS CA) *-l'aa*; (KA, KP CA) *allrak*, (PWS CA) *all'ak* 'perhaps'. On the other hand, nowhere do we find **at'a* for *atra* 'her name' (from *ateq* 'name'), which would parallel *qan'a* for *qanra* 'its mouth' (from *qaneq* 'mouth') if it occurred. With a few lexicalized exceptions in CA, voiceless fricatives do not drop after stops in any variety of Alutiiq.

2.2.2. Fricative dropping following a vowel

Fricative dropping following a vowel occurs to a varying extent as a productive phonological process in all Alutiiq. Unlike fricative dropping following a consonant, fricative dropping following a vowel occurs only with voiced fricatives preceding a single vowel; every word-medial heavy syllable must begin with a consonant. Two further limitations exist in most dialects: dropping of a voiced fricative does not occur as a productive phonological process in the environment #XV__V except in Perry KA. Furthermore, fricative dropping does not occur after *e* except in Perry KA and PWS CA.

Perhaps the most problematic issue with regard to fricative dropping between vowels is the question of how the syllable boundary is phonetically realized: do the two syllables share a single breath pulse, or does each syllable have its own? Although this issue requires further research, it is clear that the phonetic result varies dialectally and may depend on the prosodic environment. In KA the result appears consistently to have two breath pulses regardless of the prosodic environment. In CA, where the first syllable is stressed and the second unstressed, there are also clearly two breath pulses, usually accompanied by falling pitch. Where the first syllable is unstressed and the second stressed, post-FD-rule 4 (see 2.2.2.3) applies in CA, with the result that the syllable boundary is deleted and the two syllables contract into a single accented heavy syllable which has a single breath pulse. Likewise, where both syllables are unstressed, post-FD-rule 5 applies in PWS CA, resulting in the contraction of the two syllables into a single unaccented heavy syllable which has a single breath pulse. Although this rule does not apply in KP CA, the sequence |XV|V(C). is phonetically identical with the PWS CA unaccented heavy foot |XVV(C)|, having a single breath pulse in KP CA.

2.2.2.1. The Pre-FD-rule

The rule for intervocalic fricative dropping is characterized by a great deal of dialect variation. In all variants of this rule, certain voiced fricatives are dropped at the head of a light syllable (i.e. before a single vowel), resulting in a vowel-initial syllable. Except in Perry KA and PWS CA, fricative dropping may occur before but not after voiced *e*. Except in Perry KA, fricative dropping is further restricted in that it is not a productive phonological process in the environment #XV.__ V(C).

The fricatives that drop also differ dialectally. In KA, only *g* and *r* drop according to the general rule, although orthographic dropping of *y* and *w* after *u* and *i* is seen below. In GAP KA, fricative dropping is minimal and usually optional. Here it appears to occur most regularly as a means of avoiding a syllable beginning and ending in *r*, comparable to the function of *ra*-deletion in Cen-

tral Yupik, although it is obligatory in some lexical items such as *quli'anguaq* for **quliranguaq* 'story'. In KP CA, *g* and *r* regularly drop, and *y* is usually dropped by most speakers except in certain lexical items. Where the dropping of *y* is possible, however, some older KP CA speakers consider forms with *y* more authentic than those where *y* drops.[11] In PWS CA, *g*, *r*, *y* and *w* regularly drop, with the special exception of *w* in the sequence *iwa* (for which see post-FD-rule 5 under 2.2.2.3). Only one case has been found where *l* drops: in CA *cai* is a rapid-speech variant of *cali* 'also, again, some more'.

The rule for fricative dropping following a vowel is summarized below, without repeating all the details given above:

> **Pre-FD-rule 2.** *Voiced* g *or* r *(in PWS CA also* y, w, *in KP CA sometimes* y*) beginning a light syllable and following a vowel is dropped except (a) in Kodiak and GAP KA and KP CA, following voiced* e, *and (b) in Kodiak and GAP KA and all CA, in the environment* #XV.__V(C). *Such dropping is not a regular process in GAP KA.*

qɨlá|gaq (GAP KA) [qi.lá:.ɣaq], *qilá|'aq* (elsewhere) [qi.lá:.aq] 'palate'; compare *qilá|gaá* (KA) [qi.lá:ˑxá], (CA) [qi.lá:ˑɣá] 'his palate'
cás|aá|ri (GAP KA) [cás.:á:.ɣi], *casaa'i* (elsewhere) [cás.:á:.i] 'his clock'
angá|yuk (KA) [a.ŋá:.yuk], *angá|'uk* (CA) [a.ŋá:.uk], (also *angayuk* in KP CA) 'companion'; compare *angá|yuá* [a.ŋá:ˑyuá] 'her companion' (Perry KA *angasua*)
palá|yaq (KA, KP CA) [pa.lá:.yaq] 'rectangular skiff', *palá|'aq* (PWS CA) [pa.lá:.aq] 'boat'
qenᵃá|wik (KA, KP CA) [qɜ.ná:.wik], *qenᵃá|'ik* (PWS CA) [qɜ.ná:.ik] 'hospital'

Examples of fricative-dropping following voiced *e* in Perry KA and PWS CA are given under post-FD-rule 2 in 2.2.2.2.

Fricative dropping in the environment #XV.__V(C), occurs to some extent in all Alutiiq. In CA the result is a single (underlyingly heavy) syllable, whereas in KA the result is disyllabic. In Perry KA, dropping of *g*, *r* in this environment is synchronically productive; as with the examples given above, the dropped fricative is recoverable, reappearing when it heads a heavy syllable. The following are examples of minimal pairs illustrating the contrast between monosyllabic and disyllabic vowel sequences from Perryville:

ma'áq [ma.áq], elsewhere *maraq* 'swamp'
ma'á|ni [ma.á:.ni], elsewhere *marani* 'in the swamps'; compare *maá|ni* [má:.ni] 'around here'
ka'í|kutár|tuq [ka.í:ˑku.táɤ.tuq], elsewhere *kagikutartuq* 'he's going to sweep'; compare *kaí|kutár|tuq* [kaí:ˑku.táɤ.tuq] 'she's going to be hungry'

Note in the last example that *a* assimilates to the following *i* in *kai...* (approximately [kei...]), but not in *ka'i* (see 1.1). Where such fricative dropping occurs between initial *i* or *u* and a different vowel, phonological restructuring occurs such that the initial *i*, *u* becomes semivocalic and is followed by a copy of the following vowel.[12]

[11] This lack of uniformity in KP CA may represent either an intermediate, incomplete stage of prosodic evolution, or more likely, influence from Kodiak KA on the original CA prosodic system.

[12] One case has been found where two historically successive fricatives are dropped, namely *yu'ur-~yuguV-* 'to buy', found in Kodiak Alutiiq as *igu'ur-~iguruV-*; compare NSU CY *iruver-* 'to buy, trade'.

yu'ú|ka [yu.ú:.ka], elsewhere *iruka* 'my leg'; compare *yú|ruá* [yúɣ.:uá], elsewhere *irua* 'his leg'

Fricative dropping in this environment is rare outside of Perry KA. Moreover, the dropped fricative is not recoverable and hence is handled lexically in the few cases outside of KA where this is found. In all KA, dropping of *y* and *w*, in this environment as well as elsewhere in the word, occurs regularly in the rare cases where these are followed by *i* and *u* respectively.

u'úg|tuq (Perry, Kodiak KA) [u.úx.tuq], elsewhere *urúg|tuq* 'it's melting'
pu'ír|tuq (KA) [pu.íɣ.tuq], *puír|tuq* (KP CA) [puíɣ.tuq] 'it's smoking'; compare Central Yup'ik *puyirtuq*
a'ú|raí (KA) [a.ú:ᵗχái], *aú|raí* (CA) [aú:ᵗɣái] 'she's gathering them up' (Kodiak) 'she's sorting them' (e.g. berries); compare Central Yup'ik *avurai* [a.wú:.ɣái]

Such dropping in the environment #XV__V occurs in certain lexical items in CA, resulting simply in a heavy syllable. Only rarely does morphological alternation result; in most cases the dropped fricative is simply gone, e.g. PWS CA *yartuq* (KP CA *igartuq*) 'she is writing'. Compare *yaa'umuuq* (KP CA *igaumuuq*) 'she must be writing'.

2.2.2.2. Segmental adjustments

Certain phonological and orthographical modifications and neutralizations occur in the application of pre-FD-rule 2. It is most convenient to treat these here as post-FD-rules.

Post-FD rule 1. *A semivowel* (y, w) *following the corresponding high vowel* (i, u) *does not contrast with the result of fricative dropping following such a vowel.*

uyú|raq (GAP KA) [u.yú:.ɣaq], *uyú|'aq* (elsewhere) [u.yú:.aq] 'younger sibling'; compare *uyú|raa* (KA) [u.yú:ᵗχá], (CA) [u.yú:ᵗɣá] 'her younger sibling'
kulú|waq or *kulú|'aq* (KA) [ku.lú:waq = ku.lú:.aq], *kulú|'aq* (CA) [ku.lú:.aq] 'cow'; compare *kulú|waa* (KA) [ku.lú:ᵗwá], *kulú|gaa* (CA) [ku.lú:ᵗɣá] 'his cow'

In the second example, a loan from Russian *koróva* 'cow', phonemic *g* has been substituted in CA for original *w*. This example also illustrates the orthographic problem created by this neutralization. On morphological grounds, the spelling *kuluwaq* is preferable in KA, but *uwa* is not phonetically distinguishable from *u'a*.

Post-FD-rule 2. *Where fricative dropping occurs before (and in PWS CA and Perry KA also after) the vowel* e, *the* e *assimilates to the preceding (or following) vowel mora.*

kuí|get (KA, KP CA) [kuí:.ɣət] (alternating with *kui'it* in Kodiak KA and KP CA), *kuí|'it* (Perry KA) [kuí:.it], (CA) [kú:.it] 'rivers' (see Post-FD-rule 3)
qangá|te|ramék (KP CA) [qa.ŋá:.təᵗɣa.mək], *qangá|ta'a|mék* (PWS CA) [qa.ŋá:.ta:ᵗmək] 'a porcupine' (abl. sg.) (see post-FD-rule 5)
arú|lar|neré|ni (GAP, Kodiak KA) [a.ɣú:.lárᵗnə.ɣá:.ni], *a'ú|lar|na'á|ni* (Perry KA) [a.ú:.lárᵗna.á:.ni], *aú|lar|neré|ni* (KP CA) [aú:.laɣᵗnə.ɣá:.ni], *arú|lar|naá|ni* (PWS CA) [a.ɣú:.laɣᵗná:.ni], 'at the beginning of it'

Examples of fricative dropping between two *es* in Perry KA and PWS CA:

ér|ne'ét (Perry KA) [ə́x˧nɔ.ə́t], (GAP KA) *ér|nerét* [ə́x˧nɔ.ɣə́t] 'days'
éq|me'es|kék (PWS CA) [ə́q.mɔ:s˧kə́k], *éq|me|reskék* (KP CA) [ə́q.mə˧ɣəs.kə́k]
'fold them up (legs, bringing the knees to the trunk)'

A further neutralization occurs in CA (which has no simple orthographic solution): $V_1V_1'V_2$ is indistinguishable from $V_1V_2'V_2$; the phonetic result of both underlying sequences is roughly $[\acute{V}_1{:}.V_2]$. In such cases, the orthographic representation is based on the underlying morphology.

naá|'uq [ná:.uq] 'it's burning'; *naú|'uq* [ná:.uq] (KA [naú:.uq]) 'it's growing'
(stems *nau-* and *naa-*)
kuú|ggiá|'a [kú:˧xí:.a] (KA [kú:˧xiá:.a]) 'his coffee'; *kulú|ggií|'a* [ku.lú:˧xí:.a]
'his pea' (abs. sg. *kuuggiaq* and *kuluggiiq*)

Similar is the case of the homophonous sequences *ai'*V = *aay*V [á:.yV] and *au'*V = *aaw*V [á:.wV] in KP CA. Compare the rhyming pair

taí|'uq (CA) [tá:.yuq] (KA [taí:.uq]) 'she's coming'
caá|yuq (KA, KP CA) [cá:.yuq], (PWS CA *caá|'uq* [cá:.uq]) 'tea'

These neutralizations are in part the consequence of a more general principle in CA, which can be described as follows:

Post-FD-rule 3. *The sequence $V_1V_2'V_3$, where V_1 is different from V_2, is phonetically realized in CA as follows: V_1 is lengthened so as to occupy roughly the first two morae of the sequence, and the final mora is shared by V_2 and V_3.*

piá|'ut [pí:.aut] '(toward) up there'; compare *piá|ni* [piá:.ni] '(located) up there'
(*pia'ut* is still rarely found in the original form *piawet*)

2.2.2.3. Post-FD-rules 4 and 5: Contraction of XV.V(C) in CA

Post-FD-rules 4 and 5 are restricted to CA. These two rules form a special subset of post-FD rules which require redefinition of feet previously defined by FD-rules. Rule 4 operates on an iambic foot, and rule 5 operates on a sequence of unaccented light foot plus iambic foot.

Rule 4 operates on the sequence |XV.V(C)| previously defined as a disyllabic iambic foot by FD-rule IIIB2. Instead, the syllable boundary is deleted, and the resulting sequence is defined as a heavy foot. In KP CA, but not in PWS CA, there are certain environments, which seem to be morphologically determined, where this rule does not apply (see below).[13]

Post-FD-rule 4. $|XV.\acute{V}(C)| \rightarrow |X\acute{V}(C)|$

elltu'aq → *éll|tuáq* [ə́ɬ˧tuáq] 'grandchild'; compare (PWS CA) *éll|tu'a|qá*
[ə́ɬ.tu.a˧qá], (KP CA) *éll|tuá|qa* [ə́ɬ˧tuá:.qa] 'my grandchild' and
(PWS CA) *éll|tu|raá* [ə́ɬ.tu˧ɣá], (KP CA) *éll|tuá|'a* [ə́ɬ˧tú:.a] 'his grandchild'

In KP CA the result is lexicalized without the dropped fricative, hence *éll|tuá|qa* and *éll|tuá|'a*. The following illustrate the result of dropping *g* in the underlying sequence |...*ligaqa*|, from *-li-* 'make N' plus the 1.sg.-3.sg. transitive indicative ending +(*g*)*aqa:*

[13] The phonetic contrast between |XV.V(C)| and |XVV(C)| observed in KP CA has not been found in PWS CA; see further note 14.

sarsali'aqa → *sár|sa|liá|qa* [sáɤ.sa˧liá:.qa] 'I'm making tea for her'; compare *pili|'aqá* [pi.lí:.a.qá] 'I'm making some for her'
pilú|li|'aqá (KP CA) [pi.lú:.li.a.qá], *pilú|li'a|qá* (PWS CA) [pi.lú:.li.a˧qá] 'I'm making fish pie for her'

With the above may be compared the following words which have no dropped fricative between the *i* and the *a*:

sár|sa|liá|qa (same as above) 'the tea I'm making'; compare *pí|liáqa* [píl.:iá:.qa] 'the one I'm making'
pilú|liá|qa [pi.lú:˧liá:.qa] 'the fish pie I'm making'

In KP CA, this rule does not apply where fricative dropping occurs preceding a deverbal postbase. The principal deverbal postbases which involve fricative dropping are *+(u)te-*, *+(g)i-*, and *+(r)i-*. When one of these postbases is added to a verb base, resulting in the underlying sequence XV.*g*V(C). or XV.*r*V(C)., where XV*g* or XV*r* (V being a full vowel) belong to the verb base and V(C) to the postbase, the *g* or *r* drops by pre-FD-rule 2 (see 2.2.2.1), resulting in a vowel-initial syllable. Post-FD-rule 4 does not operate on the resulting sequence in KP CA. The above observation also applies to the postbase *+ya'ute-* (GAP KA and CY *+yagute-*) (V→V) 'finally V', historically a compound ending with *+(u)te-*.

qakgwarilua → *qák|gwa'í|luá* [qák˧xʷa.í:˧luá] 'I winning'; compare
qakgwariluni → (KP CA) *qák|gwa|'ilú|ni* [qák.xʷa.i.lú:.ni], (PWS CA)
qák|gwa'i|lú|ni [qák.xʷai:˧lú:.ni] 'she winning'
tekicagutua → *tekí|ca'ú|tuá* [tə.kí:˧ca.ú:˧tuá] 'I finally arrived'; compare
tekicagututen → (KP CA) *tekí|ca|'utú|ten* [tə.kí:.ca.u.tú:.ten], (PWS CA)
tekí|ca'u|tú|ten [tə.kí:.ca.u˧tú:.ten] 'you finally arrived'[14]

With these compare the lexicalized postbase *-llrarar-* in the CA noun base |*uywiillrarar-*| 'child', where intervocalic *r* is dropped, and in PWS CA also *r* after *ll*:

úy|wiíll|ra'áq → (KP CA) *úy|wiíll|raáq* [úy˧ɣʷíɬ˧χáq], (PWS CA) *úy|wiíll|'aáq* [úy˧ɣʷíɬ.:áq] 'child'; compare the plural (KP CA) *uywiillraraat*, (PWS CA) *uywiill'araat*
úy|wiíll|ra'á|nguá → (KP CA) *úy|wiíll|raá|nguá* [úy˧ɣʷíɬ˧χá:˧ŋuá] (PWS CA) *úy|wiíll|'aá|nguá* [úy˧ɣʷíɬ.:á:˧ŋuá] 'I got a child'; compare
úy|wiíll|ra|'angú|ten (KP CA) [úy˧ɣʷíɬ.χa:.ŋú:.tən] but (PWS CA) *úy|wiíll|'a'a|ngú|ten* [úy˧ɣʷíɬ.:a:˧ŋú:.tən] 'you got a child'

The difference between the KP CA and PWS CA forms in the above examples is produced by post-FD-rule 5, discussed next.

Post-FD-rule 5 operates only in PWS CA, applying in some cases where fricative dropping has occurred after a light vowel by pre-FD-rule 2. It serves to avoid the sequence |XV|V(C).CV(C)| by

[14] In cases like *qakgwa'ilua* and *tekica'utua* it is perhaps most difficult to hear the two syllabic breath pulses distinctly, especially since the stress and length of the stressed syllable is shared almost equally between the two syllables in KP CA. Nevertheless, the combined length of the *a'u* in *tekica'utua* is clearly greater in KP CA than that of *au* in *atrautua* 'I am bringing some down', and furthermore, the *a* of *a'u* is not phonetically altered by the following *u* as it is in *au* (see 1.1). In PWS CA, the vowel pair *au* is completely flattened, giving *atruutua*. Such flattening does not occur, however, after fricative dropping has operated:

úr|aúk [úy.:aúk] 'starry flounder'; compare the plural *ur'ayuut*

redefining the foot as |XVV(C)|CV́(C)| and thus simultaneously creating an unaccented heavy foot and an accented light foot. (Note that the unaccented heavy foot is transcribed as XV'V(C) in the orthography.)

Post-FD-rule 5. |XV|V(C).CV(C)| → |XVV(C)|CV́(C)

qangá|te|ramék (KP CA) [qa.ŋá:.tə↑ɣa.mə́k], *qangá|ta'a|mék* (PWS CA) [qa.ŋá:.ta:↑mə́k] 'from a porcupine'

The effect of this rule in PWS CA, and apparently the reason for its existence, is that a vowel-initial syllable is never separated by a foot boundary from a preceding unaccented syllable. We could visualize the effect of this rule as follows: the dropped *r* in the above example would be fortis if it occurred on the phonetic surface (as it does in KP CA). In PWS CA the fortition of the dropped *r* is in effect transferred to the *m* of the following syllable by moving the foot boundary rightward one syllable, so that fortition applies instead to the accented light foot-initial consonant (see also 1.3.1). But note that this phenomenon occurs only following what is an unaccented foot in KP CA. For example, the word *nuta'amek* is prosodically *nutá|'amék* in all CA; fortition from the dropped *r* is not transferred to the following *m* in PWS CA. Compare further the following forms, where stem-final *r* is dropped before the 1.sg.-3.sg. ending *+(g)aqa* and the 1.sg.-3.pl. ending *+(g)anka*:

amaraqá → *amá|'aqá* [a.má:.a.qá] 'I'm carrying it on my chest'
amaranka → *amá|'anká* [a.má:.an.ká] 'I'm carrying them on my chest'
apqaraqa → (KP CA) *áp|qa|'aqá* [áp.qa:.qá], (PWS CA) *áp|qa'a|qá* [áp.qa:↑qá] 'I'm asking her'
apqaranka → (KP CA) *áp|qa|'anká* [áp.qa:.n.ká], (PWS CA) *áp|qa'an|ká* [áp.qa:n↑ká] 'I'm asking them'
apqarlaraqa → *áp|qar|laá|qa* [áp.qaɣ↑lá:.qa] 'I always ask her'
apqarlaranka → *áp|qar|laán|ka* [áp.qaɣ↑lán.ka] 'I always ask them'

The last two examples illustrate the operation of post-FD-rule 4 above.

Note that the only phonetic difference between the KP CA and the PWS CA variants of *apqa'aqa* and *apqa'anka* is the fortition of the *q* or *k* of the final syllable in PWS CA and the corresponding shortening of *a'a* before fortis *q* in the PWS CA variant of *apqa'aqa* (see 1.3.1, end).[15] The above examples also illustrate the fact that the length of an open unaccented heavy foot in PWS CA is identical with that of an open accented heavy foot (compare *apqa'aqa* and *apqarlaaqa*, but the closed unaccented heavy foot is **longer** than the closed accented heavy foot (compare *apqa'anka* and *apqarlaanka*). Thus we cannot make the generalization that unaccented and accented heavy feet are identical except for stress.

A special subrule applies to the sequence *iwa* in PWS CA. As mentioned in 2.2.2.1, where either vowel is accented, as in stems like *iciwaq* 'early summer' and *kangíwar-* 'go toward the inside of the bay', *w* does not drop. Where post-FD-rule 5 operates on the sequence |Xi|wa.CV(C)|, however, we find instead |Xi'u|CV(C)|. The following examples contain the postbase *-wakar-* 'V so much, too much':

[15] These examples also illustrate the fact that the sequence |XV|V(C). in KP CA, where neither syllable is accented, is phonetically identical with the unaccented heavy foot |XVV(C)| in PWS CA. The reason for treating such sequences differently in PWS CA is our desire to make explicit the parallelism between post-FD-rules 4 and 5. As presented here, both these rules eliminate the syllable boundary between an unaccented vowel and a following vowel-initial syllable, so that (according to these rules) the question of whether the sequence has one or two breath pulses is unambiguously resolved in PWS CA: such sequences are invariably monosyllabic and thus have a single breath pulse.

piwá|kartûq [pi.wá:ᵗkax̣.túq] 'he's doing it too much'
pilí|wa|kartúq [pi.lí:.waᵗkax̣.túq] 'he's making too much'
sará|ni|wakár|tuq → *sará|ni'u|kártuq* [sa.ɣá.niu:ᵗkáx̣.tuq] 'he is too sleepy'

Note that the sequence *uya* requires no such special treatment; *y* simply drops in PWS CA.

iq|llu|yanár|tuq → *íq|llu'a|nár|tuq* [íq.ɬua:ᵗnáx̣.tuq] 'he appears to be lying'

2.3. Devoicing

There are two types of devoicing rules in Alutiiq. Confined to KA are the fricative devoicing rules, the first of which, pre-FD-rule 3, is associated with consonant strength (fortition and gemination). This rule is quite interesting from the standpoint of AY dialectology, comparable to a rule found in both Nunivak CY and Greenlandic which devoices geminated voiced fricatives.

The second fricative devoicing rule, post-FD-rule 4, devoices syllable-final fricatives. The motivation for this rule is that certain syllable-final fricatives are devoiced after *e*-deletion (FD-rule 1B) in Kodiak and GAP KA but not in Perry KA and CA. In order to explain this discrepancy, we must consider voicing of fricatives to be assigned before *e*-deletion in CA but after it in KA. This rule thus erases in KA the irregular voicing of certain fricatives which remains in CA after *e*-deletion has taken place. A similar rule applies in General CY but not in HBC and some Yukon CY.

The second type of rule involves the devoicing of *e* and in some cases also a contiguous continuant. Such rules are ubiquitous in Alaskan Yupik and are often difficult to describe because of the amount of variation found. The presentation here is thus a preliminary survey of the rules.

2.3.1. Fricative devoicing in KA

2.3.1.1. Syllable-initial fricative devoicing

The first fricative devoicing rule applies productively in most KA only to *g* and *r*. In Perry KA and Afognak KA (as well as Nunivak CY), this rule applies to the rest of the voiced fricative series: *l* (and in Perry KA also *ł*) is replaced by *ll*; *y* by *s*; *w* by (orthographically undoubled) voiceless *gw*. The devoicing of *y* to *s* is also found in specific lexical items common to all KA but is not phonologically productive outside of Perry and Afognak KA. Examples are *agasuuq* (KA), *agayuuq* (CA) 'cormorant' and *kęsiin* (KA, [kᵩs.:ín]), *kiyiin* (CA) 'only'.

The voiced fricatives in question are devoiced when geminated or when they head a heavy syllable:[16]

> **Pre-FD-rule 3.** *In KA, the voiced fricatives* g, r *(and in Perryville and Afognak the rest of the voiced fricatives as well) are devoiced where geminated or at the beginning of a heavy syllable.*[17]

[16] In GAP KA, a few forms have been noted which suggest that the fricative devoicing rule has been extended to fortis *g*, *r* beginning an iambic foot.

yuú|la|ranká [yú:.lá:ᵗxan.ká] or *yuú|la|'anká* [yú:.lá.an.ká] 'I'm removing them'
(cin) áq|gwa|gakí [áq.xʷá:ᵗxa.kí] or *áq|gwa|'akí* [áq.xʷá.a.kí] '(why) did she go to get them?'

The exact extent of such devoicing is at present unknown, however, so it would be premature to draw conclusions from these examples, which suggest a direct relationship between fortition and devoicing in GAP KA. This has not been found elsewhere; for example, in Perry KA we find *maqí|wiká* 'my steambath' and not **maqí|gwiká* (i.e. with [xʷ]).

Note also that the Nunivak CY fricative devoicing rule applies only to geminated fricatives (not to non-geminated fricatives at the head of a heavy syllable).

[17] The representation of voiceless fricatives in the orthography does not correspond exactly to either the phonemic or the morphophonemic level. Where *g*, *r* are devoiced by rules specific to KA, they are not written double in the orthography. Where *l* (or *ł*) and *y* are devoiced by rules peculiar to Perryville and/or Afognak KA, however, they are written *ll*, *s* (note

ág|'uq (KA) [áx.:uq], (CA) [áɣ.:uq] 'she's going'
í|ruá (KA) [íx.:uá], (CA) [íɣ.:uá] 'his leg'; compare *irú|ka* (GAP KA, CA) [i.ɣú:.ka], (Kodiak KA) [i.χú:.ka], *yu'ú|ka* (Perry KA) [yu.ú:.ka] 'my leg'
caná|gaá (KA) [ca.ná:ᵗxá] 'he's making it'; compare *caná|gak* (GAP KA) [ca.ná:ɣak], *caná|'ak* (Perry, Kodiak KA) [ca.ná:.ak] 'he's making them (2)'

Further examples of devoicing from Perryville and Afognak in contrast with the rest of KA are

ill|aí (Perry, Afognak KA) [íɬ.:aí], *íl|aí* (elsewhere) [íl.:aí] 'his relatives'; abs. sg. *ila*.
kaá|llaá (Perry KA) [ká:ᵗɬá] (alternates with the following), *kaá|ŕaá* (KA) [ká:ᵗrá], *kaá|laá* (KP CA) [ká:ᵗlá] 'his car'; abs. sg. *kaaŕaq* (KA), *kaalaq* (KP CA).
nús|aí (Perry, Afognak KA) [nús.:aí], *núy|aí* (elsewhere) [núy.:aí] 'her hair'; abs. sg. *nuyaq*.
maqí|gwiá (Perry KA) [ma.qí:ᵗxʷiá], *maqíwiá* (GAP, Kodiak KA) [ma.qí:ᵗwiá] (CA) [ma.qí:ᵗɣʷiá] 'his steambath'; abs. sg. *maqiwik*.

In PWS CA, the first and third examples undergo diphthong flattening, yielding *ilii* and *nuyii*.

2.3.1.2. Syllable-final fricative devoicing

There is in all Yupik a morphophonemic rule which devoices fricatives contiguous to voiceless consonants, and nasals following voiceless consonants. This is included among the morphophonemic rules rather than the pre-FD-rules, since it applies before certain other rules dealing with consonant clusters, such as deletion of verb-base-final /*t*/ and insertion of *e* in clusters of three consonants. It does, however, account for the voicing assigned to continuants before the operation of the pre-FD-rules. In terms of the orthography, *g* and *r* preceding voiceless consonants, and *g*, *r* and nasals following voiceless consonants (with the partial exception of *s*, which is problematic except in PWS CA) are voiceless.

In KA, pre-FD-rules 3 and 5 and post-FD-rule 6 further extend the range of fricative devoicing. Post-FD-rule 6, in particular, serves to cover up the morphophonemic rule which devoices fricatives preceding voiceless consonants by devoicing all syllable-final *g* and *r* in KA (and in Perry KA the rest of the fricatives as well) subsequent to *e*-deletion (FD-rule IA, see 3.2.1). A similar rule which devoices fricatives preceding voiceless consonants subsequent to *e*-deletion is found in General CY (but not in HBC and some Yukon CY).

Post-FD-rule 6. *Syllable-final* g, r, *and in Perry KA also* l *are devoiced.*[18] *(KA)*

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that *ŕ* may devoice to *ll* in Perryville). The purpose of this convention is largely to maximize orthographic congruity between KA and CA. Another motivating factor is the frequency with which *gg*, *rr* would otherwise have to be used. One side-effect of this convention, however, is that since the contrast between underlying *g*, *r* and underlying *gg*, *rr* is neutralized in KA where fortis or geminated by pre-FD-rule 3 below, the latter are orthographically undoubled in KA but not in CA. In modern Kodiak KA, as noted in 1.1, the neutralization of *g*, *r*, and *gg*, *rr* is complete.

igartuq (AP KA minus Perry, KP CA) [i.ɣáx.tuq], (Kodiak KA) [i.xáx.tuq] 'he's writing'
igaumaluni (KA) [íx.:aú:.má+lu.ní], (CA) [íɣ.:aú:.ma+lu.ní] 'being written'
aiggaq (KA, CA) [aí:.xaq] 'hand'
aigaa (KA), *aiggaa* (CA), both [aí:ᵗxá] 'her hand'

Similarly, orthographic adjustment sometimes results in congruity and sometimes in disparity between the KA and CA representation of voiceless nasals.

[18] Syllable-final *y* does not occur in KA (except in the case of geminate *yy*), having been devoiced to *s* in all dialects, as seen in the following example:

ás|guúr|tuq (KA) [ás+xúx.tuq], *áy|guúr|tuq* (CA) [áy+ɣúx.tuq] 'it's going against the current'

Since productive phonological *y/s* alternation does not occur in KA, devoicing of syllable-final *y* may be treated lexically.

ár|naq (KA) [áx̣.naq], (CA) [áɣ̣.naq] 'woman'; compare (KA) *ár|hnaq* [áx̣.n̥aq] 'sea otter'
kál|maá|nuq (Perry KA) [káɬ˧má:.nuq], *kál|maá|nuq* (elsewhere) [kál˧má:.nuq] 'pocket'

Post-FD-rule 6, in particular partially neutralizes the contrast between voiced and voiceless fricatives which, before the operation of this rule, arises due to *e*-deletion. For example, in *agqatartuq* (KA) [áx.qa˧taxtúq] (CA) [áx.qa˧taɣ̣.tuq] 'she is going along', *g* precedes the stop *q* in the underlying form and is devoiced in all Alutiiq. Where *e*-deletion takes place, however, as in *ageciquq* → *ág'|ciqúq* (CA) [áɣ˧ci.qúq], *ág|ciqúq* (KA) [áx˧ci.qúq], the voicing contrast seen in CA is neutralized in KA by this rule. For *g* to close the first syllable and be devoiced in KA, *e*-deletion (FD-rule IA; see 3.2.1) must apply before this rule; that is why this must be considered a post-FD-rule.

In Kodiak and GAP KA, but not in Perry KA, there is a corresponding rule which devoices voiced continuants following voiceless consonants where *e*-deletion has taken place:

Post-FD-rule 7. *In Kodiak and GAP KA, syllable-initial* g, r, *(and for some speakers also a nasal) are devoiced after a voiceless consonant other than* s.

itegaq → *ít|gaq* (Kodiak and GAP KA) [ít.xaq], *ít'|gaq* (Perry KA) [ít.ɣaq], *ít|'aq* (CA) [ít.:aq] 'foot'; compare NSU CY *itég|aq* [i.tə́ɣ.:aq]
qecenguq → *qéc|nguq* (some KA) [qə́c.n̥uq], *qéc'|nguq* (most KA, PWS CA) [qə́c.ŋuq], *qecéng|'uq* (some Kodiak and KP CA) [qə.cə́ŋ.:uq], 'she's running'

As mentioned in 1.1, retention of voicing in the Perry KA and CA forms is indicated orthographically by the apostrophe. See 3.2.1 for failure of *e*-deletion in the last example.

2.3.2. Devoicing of *e*

The rules for devoicing of *e* must operate before FD-rule IIIB1 in CA, which rule has the effect of avoiding accented voiceless syllables (i.e. syllables containing voiceless *e*) in CA (see 3.4.2). They must also apply before FD-rule IIA in KA, which also partially avoids accented voiceless syllables (see 3.3.1 and 4.3.2). Thus the *e*-devoicing rules are included among the pre-FD-rules.

The conditions for devoicing of *e* are complex and have not yet been fully explored in all dialects. Devoicing of *e* is more frequent in KA and less so in CA, especially in PWS CA. We thus see in this section and 2.3.1 that devoicing in general is more highly developed in KA, in contrast with fricative dropping, which is infrequent in GAP KA and most highly developed in PWS CA, as seen in 2.2. In both cases KP CA is intermediate, with peculiarities of distribution which suggest Kodiak influence on a CA dialect. Rules 4 and 5 are common to all Alaskan Yupik.

The first *e*-devoicing rule is associated with a morphophonemic rule which inserts *e* to break up a cluster of three consonants. In terms of this rule, *e* is inserted into the cluster $VC_1C_2C_3V$, where C_2 is a stop and C_3 is a continuant which is devoiced by the preceding stop. The result, $VC_1.C_2e.C_3V$, conforms to canonic syllabic structure. The *e* inserted according to this rule is devoiced in all Alaskan Yupik.

In the case of the intransitive participial and past tense suffix *–llria/llrii-* as well (see 2.2.1, end), *l* has been devoiced to *ll* syllable-finally in all KA. Tyzhnov's transcriptions are quite informative in this regard. Here we regularly find *g* and *ż* for syllable-final *g/r* and *s* before a voiced consonant. Before a voiceless consonant, however, we find *x* and *ś*, whether or not *e*-deletion has taken place, as in modern KA. We may thus conclude that in the late nineteenth century on Kodiak, the above devoicing rule operated before voiceless consonants but not elsewhere, as also in southwestern CY.

Pre-FD-rule 4. e *is voiceless where inserted between a stop and a devoiced continuant to break up a three-consonant cluster.*

míng|qe̯|llukú [míŋ.qə̯ˈɬu.kú] 'sewing it'; compare *taqlluku* 'finishing it'
piúg|te̯hmén (CA) [piúxˈtə̯.m̥ən] 'to the dog'; compare *kagitmen* 'to the broom'

In Kodiak KA, the last example is spelled *piugtemen*, since *m* would be devoiced together with preceding *e* by rule 10 anyway.

The following rule is also associated with a morphophonemic rule. In most Alutiiq, a homorganic fricative is inserted in the sequences *cet, kek, qek, qeq*, resulting in *cest, kegk, qerk* or *qegk, qerq*.[19] By the operation of the following rule, *e* is devoiced between a stop and a voiceless fricative whether or not the fricative is original or due to fricative insertion.

Pre-FD-rule 5. e *is devoiced between a stop and a voiceless consonant where either of these consonants are homorganic or one is a velar and the other a uvular.*

sugcetun → *súg|ce̯stún* [súxˈcə̯s.tún] 'like people, in the Alutiiq way,•language'
mingqekeka → *míng|qe̯r|ke̯gká* (some? KA) [míŋ.qə̯χˈkə̯x.ká], *míng|qeg|kegká* (CA) [míŋ.qə̯xˈkə̯x.ká] 'I sewed it'
ít|qe̯rtúq [ítˈqə̯χ.túq] 'it suddenly entered'

In CA and some KA this rule is optional if such a sequence comprises the first stressed syllable in the word.

It is not claimed that the following rules are complete descriptions of the remaining occurences of *e*-devoicing, especially in KA. The KP CA rules are the best understood. In rule 7 it can be seen how complex and sometimes optional these rules can be.

Pre-FD-rule 6. *In CA,* e *is devoiced between a stop and a following syllable beginning with a voiceless continuant.*

pe̯llút [pə̯.ɬút] 'leaves'; compare *péll|uí* (CA) [pə́ɬ.:uí] (but KA [pə̯ɬ.:uí]) 'its leaves'
pe̯hnáq (CA) [pə̯.n̥áq] 'cliff'; compare *péhn|aíq* (KP CA) [pə́n̥.:aíq] 'mountain sheep'
píng|qe̯r|te̯rrár|piár|tuq [píŋ.qə̯χˈtə̯.χáχˈpiáχ.tuq] 'there is hardly any'

Pre-FD-rule 7. *In KP CA, where a base ending in a stop plus* e *is followed by a suffix beginning with a voiceless consonant, then base-final* e *is devoiced in the following cases: (a) if verb-base-final* e *followed by a stop, and (b) optionally, if followed by a voiceless fricative.*

tekí|te̯|kutár|tuq [tə.kí:.tə̯ˈku.táχ.tuq] 'she is going to arrive'
tekí|te̯g|kuná|ku [tə.kí:.tə̯χˈku.ná:.ku] (also..|*teg*|.. [..təx..]) 'without reaching it' (stem *tekite-*)

ulú|te|kutá|raa [u.lú:.təˈku.tá:ˈɣá] 'he is going to watch her'
ulú|teg|kuná|ku [u.lú:.təxˈku.ná:.ku] 'without watching it' (stem *uluteg-*)

arí|tekú [a.ɣí:ˈtə.ká] 'my mitten'
arí|te̯gká [a.ɣí:ˈtə̯x.ká] (also ..|*teg*.. [.ˈtəx..]) 'my mittens' (stem *arite-*)

[19] According to my data, this rule may not apply in at least some GAP KA.

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Pre-FD-rule 8. *In KA,* e *may be devoiced between two voiceless consonants.*

tekí|tuq [tə̥.kí:.tuq] 'she arrived'
él̓l|pecí [ə̥ɬ˞pə̥.cí] **or** *él̓l|pecí* [əɬ˞pə̥.cí] 'you (pl.)'
mikél̓l|ra [mí.kə̥ɬ.χa] **or** *mikél̓l|ra* [mi.kəɬ.χa] 'one smaller than it'
ke|siín [kə̥s.:ín] 'only'
apér|taá|raát [á.pə̥χ˞tá:˞χát] 'they call it (thus)'

The exact conditions where this occurs have not yet been fully explored and appear to be dialectally or idiolectally variable. Devoiced *e* has not been found in word-final syllables, however.

Pre-FD-rule 9. *In GAP and sometimes in Perry KA, both* e *and preceding* g, r *may be devoiced before syllable-final* s *and* ll.

ɣgés|kan (GAP and some Perry KA) [í.xə̥s.kan], *igés|kan* (Kodiak KA) [i.xə́s.kan], (CA and some Perry KA) [i.ɣə́s.kan] 'if it falls'
agél̓l|riá (GAP and some Perry KA) [á.xə̥ɬ˞χiá], *agél̓l|riá* (some Perry KA) [a.ɣəɬ˞χiá], (some Kodiak KA) [a.xə́ɬ˞χiá], *agél̓l|'iá* (some Kodiak KA) [a.xə́ɬ.:iá] 'she went'

Note that some Perry speakers follow the GAP devoicing rule here. Both forms have been heard from a single speaker.

Pre-FD-rule 10. *In some Kodiak KA (optionally for some speakers), both* e *and* a *following syllable-initial nasal are devoiced following a stop.*

él̓l|pe̥nún **or** *él̓l|pe̥nún* (some Kodiak KA) [ə̥ɬ˞pə̥.n̥ún] **or** [ə́ɬ˞pe̥.n̥ún], *él̓l|penún* (some Kodiak KA, AP KA, CA) [ə́ɬ˞pə.nún] 'to you'
tuqús|ke̥ŋgá|qa (some Kodiak KA) [tu.qús˞kə̥.ŋ̊á:.qa], *tuqús|kengá|qa* (some Kodiak KA, [tu.qús˞kə.ŋ̊á:.qa], *tuqús|ke|ngaqá* (AP KA, CA) [tu.qús.kə˞ŋa.qá] 'the one that I am killing'

2.4. Phonetic problems with quiescent *e*

The vowel *e* is responsible for some of the thorniest phonetic and prosodic problems in Alaskan Yupik. Phonetically, the greatest area of difficulty in Alutiiq arises with syllables of the form C*e*., where C is a stop, and either *e* is voiceless and followed by a voiceless consonant, or *e* is voiced and followed by a voiced consonant. Such syllables are always phonetically unstressed and usually prosodically unaccented, since accent on voiceless syllables (except in the word-internal foot) is avoided in CA by FD-rule IIIB1 (see 3.4.2), and largely in KA by FD-rule IIA (see 3.3.1); and accent on voiced syllables of the form C*e*. results in closure of the syllable with the geminate of the following consonant by PA-rule 2, so that it is no longer phonetically of the form C*e*. (see 1.3.3).

In such sequences the presence of *e* is not ascertainable on phonetic grounds. In the sequence $C_1e.C_2V$, where C_1 is a stop and *e* and C_2 are voiceless, *e*, being completely neutral in position of articulation, is simply realized as neutral aspiration. This sequence thus cannot be distinguished phonetically from $C_1.C_2V$, since where C_1 closes the syllable and C_2 is voiceless, C_1 is aspirated, as pointed out in 1.2. The phonetic realization of voiceless *e* and the aspiration characteristic of the transitional interval between syllables where *e* is not phonologically present cannot be phonetically distinguished. Thus, for example, the existence of voiceless *e* in the KP CA form

tekí|te|kutár|tuq (KP CA) [tə.kí:.tə̥ˈku.táx.tuq] (compare *tekí|te|kutár|tuq* (PWS CA) [tə.kí:.təˈku.táx.tuq]) 'she is going to arrive'

is inferable by the fact that the accented *i* before the *t* is lengthened, which indicates that the syllable *ki* is open, and by the fact that the subsequent iambic foot is composed of *kutar* and not of *tartuq*; the latter would result from applying FD-rule IIB to **tekitkutartuq* (see 3.3.2). Moreover, in PWS CA the *e* is voiced and thus distinctly audible.

Furthermore, in the sequence $C_1e.C_2V$, where C_1 is a stop, and *e* and C_2 are voiced, *e* is extremely short, and if C_2 is *l* or a nasal, the *e* is phonetically "lost" in the onset of C_2, so that this sequence cannot be phonetically distinguished from $C_1.C_2V$, where the transitional interval between syllables is characterized phonetically by a schwa-like offglide (see 1.2). However, the vowel *e* must be regarded as underlyingly present here, as above, in order for the PA-and FD-rules to apply correctly.

We will here use the term **quiescent e** to describe *e* which is phonologically present but is either phonetically indeterminate or not realized as a distinctly audible vowel.[20] This term will also be applied to the phonetic realization of the vowel *e* in certain underlyingly accented syllables in KA (see 4.3.2).

The phonetic indeterminacy of quiescent *e* creates problems when the C*e*.CV sequence is word-initial, since (largely because of loans) word-initial consonant clusters are possible in Alutiiq (see 1.2). Thus a pair of words like

kelú|mi [k(ə.)lú:.mi] 'back away from open area'
kél|uá|ni [kə́l.:uá:.ni] 'to the back of it (away from open area)'

illustrates that *e* is morphologically present in the base *kelu-*. However, in a loan like

kelú|caq [k(ə.)lú:.caq] 'key', from Russian *klyúch*

there is no compelling reason for orthographic *e*. The preferred spelling for this word would be *kluucaq* were it not for the spelling problem this creates by comparison with *kelumi*. In a few loans such as *třupaq* 'stovepipe', it is in fact impossible to insert orthographic *e*, since the spelling **teřupaq* would imply that *u* is iambically accented and thus lengthened. Thus there is a clear conflict between the native lexicon and loans with regard to word-initial clusters.

In a couple of stems, we are even confronted with allomorphy involving an initial consonant cluster in a native word. The following example is common to all Alutiiq:

stuú|ka [stú:.ka] 'my (finger-)nail'; compare CY *cetú|ka* [cə̥.tú:.ka]
és|tuá [ə́sˈtuá]'her (finger-)nail'; compare CY *cé|tuá* [cə̥́ˈt.:uá]

The fact that respelling is necessary in this case could be used as justification for treating all bases of the shape C*e*CV(C)-, where *e* is quiescent, as occurring in allomorphic pairs (with and without *e*). For example, it would be possible to allow orthographic alternants like *kluumi* versus *keluani* (see above), *pnaq* 'cliff' and *pnaami* 'on the cliff' (see 1.3.4 for the spelling convention regarding double vowels in initial syllables) versus (KA) *penaiq*, (KP CA) *pehnaiq* 'mountain sheep' (see pre-FD-rule 6), and in KA also *kneq* 'fire' versus *kenra* 'its fire' (see 2.3.2 for *e*-devoicing). We would also have to allow for more complex allomorphy such as *kguutaa* 'he bites with it' (instead of *keggutaa*, from *kegge-* plus *+(u)te-*) versus *keggaa* 'he bites it'. Such treatment would lead to an orthographic solution which is closer to the phonetic surface but would require special rules

[20] Compare the fate of *shwa naS* "unstable shwa" (or perhaps more aptly "fickle shwa") in Hebrew.

to generate the correct orthographic form from the underlying form. This goes counter to the general principle that the orthography should represent the word at a phonemic level. Thus we have chosen to represent the forms with quiescent *e* as *kelumi*, *pehnaq* (Kodiak *penaq*, see pre-FD-rule 10 under 2.3.2), *keneq*, *keggutaa* (but at present we lean toward the spelling without *e*, e.g. *kluucaq* for Russian loans).

Further examples of quiescent *e* are sometimes found between homorganic consonants and between velar and uvular consonants. In Alutiiq (as well as the rest of Alaskan Yupik), for example, the *e* of the base *tangerr-* 'see' may be quiescent, so that the initial (unstressed) syllable and the second syllable with prosodically stressed *e* are together phonetically realized as a single stressed syllable:

tangér|tuq [ta.ŋə́χ.tuq] or [táŋχ.tuq] 'she sees'; compare further *kakə́g|lluk* [ka.kə́χ.łuk] = [kákx.łuk] 'nasal mucus'

where voiceless *e* in *kakeglluk* results in the same phonetic stress on the first syllable as does quiescent *e* in *tangertuq*; see further 4.3.2.

Another unique instance of *e*-quiescence recently discovered in KP Alutiiq occurs in the postbase *-lesiik* 'one who loves N or V-ing', e.g. in *tá|ngalé|siik* [tá:ɬŋál ɬsík] or (marginally for some speakers) [tá:ɬŋa.ləs.:ík]. The usual pronunciation of this word, with quiescent *e*, is indistinguishable from *taangaalsiik*; in fact it was spelled this way until it was discovered that the postbase is productive and closer examination uncovered the presence of quiescent *e*. (Compare the case of *tuqulinesinaq* in KA under 4.3.2.1.)

Furthermore, the *e* of the negative postbase found in CA and optionally in some Kodiak KA as *-n'ete-* is phonetically realized as syllable-final *n* followed by syllabic *n* before an alveolar consonant. Compare for example

cán|'etúq [cán.:n̩.túq] 'nothing is happening to it'; but compare *qán|tuq* [qán.tuq] 'it's near' and *cán|'engúq* [cán.:ə.ŋúq] 'nothing happened to it'

For further discussion and examples of quiescent *e* in KA see 4.3.2.

3. The prosodic rules

3.1. Methodology and typology of the prosodic rules

Perhaps the most salient distributional feature of the Alutiiq FD-rules is their applicability with respect to **initial** and **non-initial** foot definition—that is, the definition of the first foot in the word and the definition of subsequent feet. By the type of foot a rule defines, we may distinguish three types of rules: **initial** FD-rules (IA, IB, IC), which apply only initially; **non-initial** FD-rules (IIA, IIB, IIC, IIIB1), which apply only non-initially; and **global** FD-rules (IIIA, IIIB2), which apply both initially and non-initially.

The prosodic feet produced by these FD-rules (with the exception of IA and IB) belong to two major types: the **unaccented** foot, resulting from the operation of the non-initial FD-rules IIA and IIB; and the **accented** foot, resulting from the operation of the remaining rules. Except in PWS CA, there is only one type of unaccented foot, which consists of an unaccented light syllable. In PWS CA, however, post-FD-rule 5 results in the definition of a second type of unaccented foot, the unaccented heavy foot (see 2.2.2.3). The accented foot has several possible configurations, in all of which the initial consonant of the foot is fortis and the final (or only) syllable of the foot is accented. Using this typology of foot types, we can make an important generalization about the distribution of foot types: an accented foot may be followed by either an accented or an unaccented foot, but in CA, an unaccented foot may be followed only by a (non-initial) accented foot, and in KA, an

unaccented foot may be followed only by either an accented foot or a **voiceless** unaccented foot (see further 3.3). This means that two unaccented feet may not occur in succession, except in KA only where the second unaccented foot is voiceless.

A corollary of this generalization is the close parallel between the unaccented FD-rules IIB and IIC and the accented FD-rules IIIA and IIIB1 plus IIIB2. Rule IIB applies to a single light syllable preceding a heavy syllable (as well as word boundary); the heavy syllable is subsequently defined as an accented heavy foot by rule IIIA. Rule IIC applies to a light syllable preceding a sequence of two light syllables. The two light syllables are subsequently defined as an iambic foot by rule IIIB2 (in CA rule IIIB1 applies instead if the second of the two syllables is voiceless). Thus where rule IIB has applied, rule IIIA applies in the next cycle; the same relationship holds for rules IIC and IIIB.

We can now proceed to categorize the types of feet produced by the FD-rules in terms of their syllable structure. As mentioned above, the unaccented foot has only one possible configuration in most Alutiiq (two in PWS CA), but the accented foot has three possible configurations. These may be categorized and symbolized as follows (L = light syllable, H = heavy syllable):

1. **Unaccented light foot:** L|. Consists of a single light unaccented syllable; produced by FD-rules IIA, IIB, and IIC.

2. (PWS CA only) **Unaccented heavy foot:** H|. Consists of an unaccented syllable containing two vowels; formed by contraction of XV.V(C), according to post-FD-rule 5, which applies only in PWS CA.

3. **Accented light foot:** Ĺ|. Consists of a single light closed accented syllable; produced by FD-rules IC and IIIB1.

4. **Accented heavy foot:** Ĥ|. Consists of a single heavy accented syllable; produced by FD-rules IIIA and post-FD-rule 4 in CA (see 2.2.2.3).

5. **Iambic foot:** LĹ|. Consists of two light syllables, of which the second is accented; produced by FD-rule IIIB2.

Finally, we should remark on the ordering of the FD-rules. Rules IA and IB, as mentioned, are ordered before and feed rule IC. Rules IC, IIA and IIC are also ordered before rule IIIB2. The initial rules (IA, IB, IC) are not ordered with respect to the non-initial rules (IIA, IIB, IIC), since they apply in complementary environments. Rule IIA applies before rules IIB and IIC in KA, but in Perry KA rule IIA must be stated so that it has the effect of allowing rule IIC(b) to operate where IIA would take precedence over it in the rest of KA. The rules are presented here in the order IA, IB, IC, IIA, IIB, IIC, IIIA, IIIB1, IIIB2; applying the rules in this order will give the right results.

3.2. Initial foot definition rules

As discussed in 3.1, the initial FD-rules are restricted in application to the first prosodic cycle. Historically, the first such rule to arise in Yupik is the one here called the initial light closed foot definition rule (FD-rule IC), found in all Alaskan Yupik, but not in CSY. The other two initial FD-rules found in Alutiiq, IA and IB, are restricted variants of what are global rules in CY. Furthermore, we have seen that FD-rules IIA and IIB are non-initial FD-rules—that is, they do not operate in the first cycle, whereas the corresponding rules in CY are global rules.

Thus, in Alutiiq we find that the prosodic rules defining the initial foot differ so much from those defining the non-initial foot that it may be found convenient to describe them separately. This approach is taken in the flow charts summarizing the FD-rules given in section 3.5. An important advantage of such presentation is that the FD-rules which apply in the first prosodic cycle (IA, IB, IC, IIIA, IIIB2) are identical for KA and CA and thus may be included in the same flow chart of initial foot definition. The description of non-initial foot definition, however, diverges and must be

treated separately in the two dialects.

There is an important difference between rules IA and IB, and the rest of the FD-rules. The latter result in the definition of a prosodic foot, to which P-rules are applied and the cycle is completed. The *e*-deletion and automatic gemination rules (IA and IB), on the other hand, do not define a foot. Where they apply, they create a closed initial syllable which is then defined as a foot by FD-rule IC.

3.2.1. FD-rule IA: *e*-deletion

Unlike the CY *e*-deletion rule, which operates throughout the word, the Alutiiq *e*-deletion rule applies only in the first cycle of accent-assignment:

FD-rule IA. #XV.C*e*. → #XVC.

The resulting initial closed syllable is subsequently defined as an accented foot by IC.

qaneqa → *qán|qa* [qán.qa] 'my mouth'
eneliuq → *én|liúq* (CA) [ə́n+liúq] 'he's making a house'

In KP CA and optionally in some Kodiak KA, this rule fails to apply in a morphologically determined environment: when a suffix beginning with a vowel is added to a verb base of the shape (C)VC*e*C*e*-, yielding the sequence #(C)VC*e*CV, the *e* is not deleted. Instead, FD-rule IIIB2 applies, yielding a disyllabic iambic foot, and the following consonant is geminated according to PA-rule 2:

qecenguq → *qéc|'nguq* (most KA, PWS CA) [qə́c.ŋuq], *qéc|nguq* (some KA) [qə́c.ŋuq], *qecéng|'uq* (some Kodiak KA and KP CA) [qə.cə́ŋ.:uq] 'she is running'

In some Kodiak KA, this rule may optionally fail to apply also where *e* is flanked by identical consonants:

qaneni → *qán|ni* (Perry KA, PWS KA) [qán.ni], *qán|'i* (Kodiak KA, KP CA) [qán.:i], also *qanén|i* (Kodiak KA) [qa.nə́n.:i], 'her (refl.) mouth' (see further 1.3.2).

In some Kodiak KA, post-FD-rule 4 (as well as post-FD-rule 5 in Kodiak), applies to consonant clusters produced by the *e*-deletion rule, resulting in devoicing of certain voiced continuants contiguous to voiceless consonants (see 2.3.1.2). Elsewhere, the fact that the voiced continuant remains voiced is indicated orthographically by an apostrophe separating the two consonants, as in *qec'nguq* above.

3.2.2. FD-rule IB: Automatic gemination

In CY, the definition of a light open syllable as an unaccented foot results in gemination of the consonant following the vowel of the unaccented foot. In Alutiiq, however, such gemination occurs only in the first syllable of the word. It thus becomes necessary to describe gemination in the word-initial syllable by a separate rule, which applies in both KA and CA:

FD-rule IB. XV.C → #XVC.:/__VV(C).

By FD-rules IC and IIIA, both syllables are defined as accented feet. Automatic gemination is not indicated in the orthography. In this paper, the slash denoting foot division is placed after the geminated consonant; it is to be understood that the following foot begins with this same consonant.

át|íí [át.:í] 'his father'

Note that gemination produced by this rule is identical with morphological gemination. Therefore, morphological gemination, like automatic gemination, is not orthographically indicated in this environment, as the following example shows:

át|aá [át.:á] 'he put it on', cf. *át|'aqá* [át.:a.qá] 'I put it on'

3.2.3. FD-rule IC: Initial light closed foot definition

This rule defines an initial light closed syllable as an accented foot:

FD-rule IC. #XVC. → #XV́C|

án|ngaqá [án+ŋa.qá] 'my older brother'
pín|ka [pín.ka] 'mine (pl.)'[21]
ét|'uq [ət.:uq] 'she is there'

As discussed in 1.3.4, in cases where an initial closed accented foot phonetically contains a single short full vowel, it cannot be determined without recourse to morphological comparison whether this foot is underlyingly light or heavy. For example, in the pair

táq|lluní 'getting done' (underlyingly *taqlluni*)
náq|llukú 'reading it' (underlyingly *naaqlluku*),

the initial syllable has the same rime in both cases (and this is reflected in the orthography). Therefore, a person attempting to apply the FD-rules to *naqlluku* without knowing its underlying form will erroneously apply rule IC, not knowing that rule IIIA (heavy foot definition) should apply here instead. However, this problem is strictly a theoretical one, since whichever rule is applied, the result is the same.

3.3. Unaccented foot definition rules

In contrast with the initial foot definition rules, the Alutiiq unaccented FD-rules operate only after the first prosodic cycle. This is not the case in CY, where the retractive stress rules, which correspond to the Alutiiq unaccented FD-rules, operate also in the first prosodic cycle and are thus global rules.[22]

As mentioned in 3.1, in CA the unaccented foot occurs only preceding (non-initial) accented feet (i.e. heavy feet and iambic feet), which begin with fortis consonants. In KA the unaccented foot may also precede a voiceless unaccented foot. Thus the unaccented foot (or in KA the series of unaccented feet of which all but possibly the first are voiceless) is always followed by a fortis consonant. Whereas the accented foot is strengthened in two ways, by fortition of its initial consonant and by the accenting of its final (or only) syllable, the unaccented foot is not strengthened in either way. In

[21] Unlike CY, monosyllabic bases (e.g. *pi-*) do not provide exceptions to this rule in Alutiiq. Thus, for example, we find *pinka-llú* instead of (CY) *pinká-llu* 'and mine (pl.)'

[22] The term **retractive stress**, which has been used in the description of CY prosody and in earlier drafts of this paper, requires some explanation. The original motivation for the use of this term is that where the accent (stress) assigned by the iambic FD-rule (FD-rule IIIB2, see 3.4.3) fails to occur on the second of two light syllables, the stress was said to be "retracted" to the preceding syllable. Thus in CY, the occurrence of CV́C.CV. instead of *CVC.CV́ is said to be due to retraction of the stress due to fall on CV. In the approach taken here, however, FD-rule IIC is ordered before the iambic FD-rule. In this way it is not necessary to assign stress (by defining an iambic foot) and subsequently "retract" the error, as it were. Furthermore, these "retractively stressed" syllables (i.e. unaccented feet) are not stressed in CA.

KA, the non-word-final unaccented foot is weakly stressed and may be elevated in pitch (with some speakers or subdialects, it is higher in pitch than the accented syllable of a contiguous accented foot). In CA, however, the unaccented foot is neither stressed nor elevated in pitch (see 1.4.2).

FD-rule IIA is confined to KA. This rule deals with monosyllabic light foot definition before a voiceless syllable. Where there is a sequence of more than one voiceless syllable satisfying the conditions of the rule, this rule continues to apply in successive cycles. Moreover, rules IIB and IIC can apply in the next cycle after IIA has applied. Thus in KA we may obtain a sequence of more than one unaccented foot by the iterative operation of this rule.

Rules IIB and IIC, on the other hand, can apply only once in succession. In the case of rule IIB, non-iterativity follows from the conditions where the rule applies: before a heavy syllable or word boundary. Rule IIC, on the other hand, applies to sequences of three light syllables, and we may easily find instances of more than three light syllables where this rule could apply more than once in succession—but this is not permissible.

Thus in CA (where rule IIA does not operate) only one unaccented foot may occur in succession, and we may make the further generalization that an unaccented foot can be followed only by an accented foot or word boundary. This generalization can be stated in a modified form for KA: only one **voiced** unaccented foot may occur in succession, and in a series of unaccented feet, all but possibly the first unaccented foot must be voiceless. It follows then that in KA an unaccented foot can be followed only by an accented foot, a voiceless unaccented foot, or word boundary.

3.3.1. FD-rule IIA: Unaccented foot definition before a voiceless syllable

This rule operates only in KA. As mentioned above, rule IIA can apply more than once in succession, and rules IIB and IIC can apply in the next cycle after rule IIA, resulting in sequences of more than one unaccented foot in KA. The general rule for KA (which must be modified for Perry KA) is as follows:

> **FD-rule IIA:** |XV(C) → |XV(C)|/__C*e̯*(C). *(or /__Ce., where* e *is quiescent: see 4.3.2).*

The following examples show how this rule applies to voiceless syllables:

> *lií|ta|qe̯g|kii* [lí:.tá.qə̯x̟kí] 'she recognized him'
> *lií|ta|qe̯g|kutá|raá* [lí:.tá.qə̯x̟ku.tá:.ɣá] 'she is going to recognize him'

In both these words, the foot |ta| is defined by rule IIA, whereas the foot |qeg| is defined by rule IIB in the first example and IIC(a) in the second.

We also find sequences of voiceless unaccented feet due to repeated applications of this rule followed by rule IIB and IIC:

> *íq|llu|te̯|ke̯g|kii* [íq.łú.tə̯.kə̯x̟kí] 'he lied about her'
> *íq|llu|te̯|ke̯g|kutá|raá* [íq.łú.tə̯.kə̯x̟ku.tá:.ɣá] 'he is going to lie about her'

Here |llu| and |te| are defined by successive applications of rule IIA, and |keg|, as above, is defined by rule IIB or IIC(a).

When the final accent-advancing portion of the word is reached (this includes inflectional suffixes and postbases typically associated with them), rule IIA continues to apply in most KA, but for conservative Perry KA speakers, rule IIA does not apply where rule IIC(b) can apply instead. This is discussed further in 4.3.2; a couple of examples illustrating the differing results will suffice for now.

iq|llu|te|kaqá (most KA) [íq.łú.tə˧ka.qá], *iq|llu|teká|qa* (Perry KA) [íq.łu.˧tə .ká:.qa] 'I'm lying about him'
iq|llu|te|ke|ciqá|qa (most KA) [íq.łú.tə.kə˧ci.qá:.qa], *iq|llu|te|kecí|qaqá* (Perry KA) [íq.łú.tə˧kə.cí:˧qa.qá] 'I will lie about him'

In most KA rule IIA applies when the voiceless syllable *te* (first example) or *ke* (second example) is encountered. These syllables are themselves subsequently defined as unaccented feet by rule IIC(b). In Perry KA, however, when these voiceless syllables are encountered, rule IIA does not apply because the **following** syllable belongs to the accent-advancing portion of the word; hence rule IIC(b) applies immediately, the net result being one less unaccented foot in Perry KA.

3.3.2. FD-rule IIB: Unaccented foot definition other than before a light syllable

This rule corresponds to the CY rule which assigns retractive stress to a light syllable before a heavy syllable. As mentioned above, in CY this is a global rule, but in Alutiiq it is a non-initial FD-rule. Initially, a sequence of light syllable plus heavy syllable is operated on by FD-rule IB (if the light syllable is open) plus FD-rule IC in Alutiiq, resulting in a closed monosyllabic accented foot. FD-rule IIB, which applies in both KA and CA, defines a single light syllable before a heavy syllable or word boundary as an unaccented foot:

FD-rule IIB. |XV(C). → |XV(C)|/__CVV(C). *or* /__#

The resulting unaccented foot is stressed and elevated in pitch before a heavy syllable in KA but not in CA.

iq|llu|kiŋ|nga (KA) [íq.łú˧kí:.ŋa], (CA) [íq.łu˧kí:.ŋa] 'she lied to me'
uggá|ci|maán (KA) [u.xá:.cí˧mán], (CA) [u.xá:.ci˧mán] 'you must be good at it'
ikú|ni [i.kú:.ni] 'over there'

3.3.3. FD-rule IIC: Unaccented foot definition before two light syllables

Historically, this rule may be compared to the CY rule which assigns retractive stress to a light closed syllable before a light open syllable. In Alutiiq, however, this rule applies only in a sequence of three light syllables whether or not the first of these light syllables is closed.

In both KA and CA there are restrictions on the applicability of this rule. In CA, the only restriction is that the rule fails to apply if there is an enclitic boundary between the second and third light syllables. In KA, however, the restrictions are much more far-reaching and complex in terms of both conditioning and dialect variation. The rule applies only where the second light syllable is marked as **accent-advancing**, a characteristic which is determined in various ways—by syllable shape and position, morpheme shape, or lexical marking of a morpheme. For this reason, a whole section of this paper (section 4) is devoted to discussion of the environments where this rule applies in KA. Here, therefore, the conditions for applicability of this rule in KA are presented only in abbreviated form.

FD-rule IIC. |XV(C). → |XV(C)|/__XV(C).XV(C). *(where Sn is the first light syllable—the one defined as a foot by the rule, Sn + 1 the second, and Sn + 2 the third), unless there is an enclitic boundary between Sn + 1 and Sn + 2.*[23] *In KA, this rule is further restricted so that it applies only under the following conditions:*

[23] The enclitic *-llu* appears to be a partial exception in KA. Where it is added to nouns in an additive construction, e.g. in the following examples from KA,

(a) where Sn + 1 and Sn + 2 together constitute an allomorph of a postbase (or lexicalized postbase combination) of which both syllables are light.
(b) where Sn + 1 is to the right of the word-final accent-advancing boundary (i.e. is included in the accent-advancing final portion of a word).

The following examples illustrate failure of the rule at an enclitic boundary:

atú|qu|nikí [a.tú:.qu˩ni.kí] 'if he (refl.) uses them'
atú|qunî|-mi [a.tú:˩qu.ní:.mi] 'what if he (refl.) sings?'

The following CA examples illustrate the regular pattern of unstressed foot plus iambic foot in sequences of three light syllables subsequent to initial foot determination. These all end with *-sur-* 'hunt for N' plus *-kutar-* 'be going to V' plus the 3.refl.sg. conditional ending *-kuni*:

pisú|qu|taqú|ni [pi.sú:.qu˩ta.qú:.ni] 'if he (refl.) is going to hunt'
mangár|su|qutá|quní [ma.ŋáχ.su˩qutá:˩quní] 'if he (refl.) is going to hunt porpoise'
át|sar|suqú|ta|quní [át.saχ˩su.qú:.ta˩qu.ní]'if he (refl.) is going to get berries'
tán|'er|lirsú|qu|taqú|ni [tán.:ɔɣ˩liχ.sú:.qu˩ta.qú:.ni] 'if he (refl.) is going to hunt bear'

In KA, on the other hand, subcondition (b) results in the disyllabic postbase *-kutar-* being defined as an iambic foot in such examples: *pisú|qutá|quní, mangár|su|qutá|quní, át|sarsú|qutá|quní.*

A few more examples from KA are given here to illustrate the major sources of accent-advancing syllables, to be discussed more fully in section 4:

(a) **morpheme shape:** the initial syllable of a postbase composed of two light syllables is accent-advancing (see 4.1).

kúg|ya|sinâ|qa [kúx.yá˩si.ná:.qa] 'my big net' (*-sinaq* 'big N')
pék|yu|ca(r)tú|raá [pɔ́k.yú˩ca(χ).tú:˩χá] 'he went to work with or for her'
(+ *ya(r)tur-* 'go in order to V')

(b) **distributional type of morphemes:** the syllables of inflectional endings and certain postbases immediately preceding these endings are marked as accent-advancing, subject to certain restrictions and dialectal variation (see 4.2).

atú|qu|nikí [a.tú:.qú˩ni.kí] 'if she (refl.) uses them'
íq|llu|kuní [íq.ɬú˩ku.ní] 'if she (refl.) lies'

The following example, admittedly contrived, illustrates the striking difference in stress assignment that can occur between CA and KA due to the much restricted applicability of FD-rule IIB in KA. The word translates 'if he (refl.) is going to undertake constructing a freezer for them':

kúm|lacî|wilî|ya|qutá|qu|nikí (KA) [kúm.la.cí:.wi.lí:.yá˩qu.tá:.qú˩ni.kí]
kúm|la|ciwî|li|yaqú|ta|quní|ki (CA) [kúm.la˩ci.wí:.li˩ya.qú:.ta˩qu.ní:.ki]

Uvú'a|nillú agellriik. 'She and her younger brother went.'
Nulím|llu agellriakuk. 'My wife and I went.'

this enclitic takes first and second person possessor suffixes characteristic of case endings in KA and KP CA. Compare with the above *uvu'ani* 'her (refl.) younger brother', *uvu'aminek* 'from her (refl.) younger brother', *nuliqa* 'my wife', *nulimnek* 'from my wife'. Thus in this construction the enclitic behaves partially like a case ending, and in KA, FD-rule IIB applies as if there were no enclitic boundary here, as seen with *uvú'a|nillú*. In KP CA, however, the enclitic boundary is maintained in third person possessed forms so that this rule is blocked: *uvú'ani-|llu*.

In KA the definition of *li* as an unaccented foot allows the bisyllabic postbase *-kutar-* 'be going to V' (here *quta*) to form an iambic foot, and *ku* is defined as unaccented foot before the accent-advancing syllable *ni* in the conditional 3R.sg.-3.pl. ending *-kuniki* (here *quniki*). In CA, FD-rules IIC and IIIB2 alternate uniformly throughout the word subsequent to initial stress assignment.

3.4. Global and non-initial accented foot definition

As mentioned in 3.1, rules IIIA and IIIB2 are global FD-rules—they operate in both initial and non-initial foot definition. Rule IIIB1, on the other hand, is a non-initial FD-rule which results in the definition of a monosyllabic iambic foot. Such a foot is light and accented and thus has the same configuration as an initial foot, which is likewise monosyllabic, light, and accented. As we have seen in 3.1, however, these two types of feet are in complementary distribution, the former occurring non-initially and the latter initially.

Rule IIIA defines a heavy syllable as an accented foot and is common to all Yupik and Bering Strait Inupiaq. Rule IIIB contains two subrules, both of which define an accented foot in a sequence of two light syllables. Rule IIIB1, confined to CA, defines one of a sequence of two light syllables as an accented light foot. This rule is ordered before rule IIIB2, which defines a sequence of two light syllables as an iambic foot. Rule IIIB2 is common to all Alaskan Yupik, and a similar rule is found in CSY and Bering Strait Inupiaq.

The feet produced by these rules undergo two important phonological processes: fortition of the initial consonant of the first syllable of the foot, and accent of the final (or only) syllable of the foot. As noted in 1.3.1, fortition of a syllable-initial consonant must be described even in phonetic terms as a function of the syllable boundary before the fortis consonant (i.e. before the accented foot). Also, there is no contrast between fortis and non-fortis consonants word-initially or when the consonant is geminated. Furthermore, in most modern Kodiak KA distinctive fortition has not been observed with iambic feet, and fortition may be difficult or impossible to discern in certain environments in all dialects of Alutiiq. With these reservations, discussed more fully in 1.3.1, all accented feet begin with fortis consonants.[24]

Two important phonetic adjustments also apply to the accented syllable of an accented foot: an open syllable whose vowel is not *e* is phonetically lengthened by PA-rule 3, and an open syllable whose vowel is voiced *e* is closed with the geminate of the following syllable is lengthened by PA-rule 2 (see 1.3.3). Thus, all accented light feet consist of an accented syllable with a fortis initial consonant.

As pointed out in 1.3.4, it follows that an accented light foot containing a prime vowel is phonetically identical with a heavy foot containing a double of this prime vowel. In such cases, the non-initial accented light foot can be distinguished from the heavy foot only by examining its environment or, as we have seen in the similar case of initial feet (see 3.2.3), by knowledge of the underlying morphology. In the case of |XVV(C)|XV́(C)| in PWS CA, one can infer that |XV́(C)| is an accented light foot rather than an accented heavy foot because the preceding unaccented heavy foot |XVV(C)| arises exclusively from the operation of post-FD-rule 5, where the unaccented heavy foot is always followed by an accented light foot. In the case of a non-initial monosyllabic accented foot followed by a voiceless syllable in CA, however, it is not possible to tell by the surface phonetic form whether the foot is an accented light foot produced by rule IIIB1 or an accented heavy foot.

3.4.1. FD-rule IIIA: Heavy foot definition

This rule is found in all Yupik and Bering Strait Inupiaq. It defines a heavy syllable as an ac-

[24] In fact, it would be possible to dispense with accent marks altogether if a distinctive foot-separating marker were used before the non-initial accented foot. This marker would then serve as a mnemonic for the fact that the following consonant is distinctively fortis. In this scheme, a foot following word boundary would be accented, a foot following the accented foot marker would be accented and begin with a distinctively fortis consonant, and a foot following the unaccented foot marker would be unaccented.

cented foot. Note that a single non-initial light syllable preceding a heavy syllable is always defined as a non-accented foot by IIB, and a non-initial pair of light syllables preceding a heavy syllables is always defined as an iambic foot by IIIB2 (except in CA, where IIIB1 produces a monosyllabic iambic foot before a voiceless syllable).

FD-rule IIIA. XV̆V(C). → XV̆V̆(C)|

aá|nakú [á:ˈna.kú] 'my mother'
án|cí|quá (KA) [án.cíˈquá], (CA) [án.ciˈquá] 'I will go out'
át|mageí|quá [átˈmax.cíˈquá] 'I will backpack'

It was noted in 3.2.3 that an initial closed heavy syllable underlyingly containing a double vowel is phonetically and orthographically indistinguishable from an initial light closed syllable, which however would also be stressed by FD-rule IC if light.

naá|qaá [ná:ˈqá] 'she's reading it', but *náq|llukú* [náqˈɬu.kú] 'reading it'
(from underlying */naaqe-/*)

3.4.2. FD-rule IIIB1: Accented light foot definition before a voiceless syllable in CA

This rule, which avoids accented voiceless syllables, operates in all CA. In KA, foot definition involving the stressing of voiceless syllables is instead handled by FD-rule IIA (see 3.3.1 and 4.3).

FD-rule IIIB1. |XV(C). → |XV́(C)|/ __C̨e(C) (*or* /__Ce., *where* e *is quiescent*)

íq|llús|qe̬|lluá [íqˈɬús.qə̬ˈɬuá] 'telling me to lie'
iqúk|lli|te̬ll|raá [i.qúkˈɬi:.tə̬ɬˈχá] 'it reached the end'
gllií|pa|lís|qe̬g|kuná|ku [xɬí:.paˈlís.qə̬xˈku.ná.ku] 'telling him not to make bread'

In most cases the second syllable referred to by the rule is voiceless, but the rule also applies where this syllable is an allomorph of the negative postbase *-n'ete-* (here the *e* is phonetically realized as syllabicity of the preceding *n*) and with other extremely rare cases of open syllables with "quiescent" *e* (see 2.4 and 4.3).

gllií|pa|lín|'e|tutén [xɬí:.paˈlín.:n̩ˈtu.tə́n] 'you are not making bread'
gllií|pa|lín|'etúq [xɬí:.paˈlín.:n̩.túq] 'she is not making bread'

As discussed above, the resulting accented light foot is phonetically indistinguishable from a heavy foot, since the initial consonant is fortis and the syllable is stressed. Thus the words

íq|sa|lís|qe̬|llukú [íq.saˈlís.qə̬ˈɬu.kú] 'telling (him) to make a hook for her'
íq|sa|liís|qe̬|llukú [íq.saˈlís.qə̬ˈɬu.kú] 'telling (him) to put a hook on it'

are phonetically identical. Such homophony is, however, quite rare.

The question arises: what if the syllable preceding the voiceless syllable is also voiceless? Would this not result in a voiceless accented syllable? In practice, forms which would allow stress assignment to be determined in such cases are rare. In a case like *angqercesllua* 'hurting me', it is impossible to tell which voiceless syllable is accented; the form could be interpreted as either *áng|qercé̬s|lluá*, *áng|qé̬r|ce̬s|lluá*, or *áng|qe̬r|ce̬s|lluá*.[25]

[25] Examples of the sequence |XV(C).C̨e(C).C̨e(C). are even rarer, but have been recorded consistently as the following example indicates:

3.4.3. FD-rule IIIB2: Iambic foot definition

This rule is found in all Alaskan Yupik. It defines an iambic foot from a sequence of two light syllables and is ordered after FD-rules IA, IC, IIA, IIC, and (in CA) IIIB1, all of which define monosyllabic accented feet.

FD-rule IIIB2. XV(C).XV(C). → XV(C).XV́(C)|

atá|ka [a.tá:.ka] 'my father'
kúm|lací|wiká (KA) [kúm˗la.cí:˗wi.ká], *kúm|la|ciwí|ka* (CA) [kúm.la˗ci.wí:.ka]
'my freezer'
án|kutár|tuá [án˗ku.táɣ˗tuá] 'I'm going to go out'
án|kutár|tutén (KA) [án˗ku.táɣ˗tu.tə́n], *án|ku|tartú|ten* (CA) [án.ku˗taɣ.tú.tən],
'you're going to go out'
át|ma|kutár|tutén (KA) [át.má˗ku.táɣ˗tu.tə́n], (CA) [át.ma˗ku.táɣ˗tu.tə́n]
'you're going to backpack'

The last three examples show convergence and divergence in KA and CA with the disyllabic postbase *-kutar-*, of which the first syllable is accent-advancing in KA. In *ankutartua*, the sequence of only two light syllables can be defined only as an iambic foot. In *atmakutartuten*, *ma* forms an unaccented foot in both dialects, but for different reasons: in KA, because *ku* is accent-advancing; but in CA, simply because there is a non-initial sequence of three light syllables which is not acted on by any other iambic FD-rule.

3.5. Lexically assigned stress in CA

In CA there are relatively rare cases where accented foot definition cannot be predicted by the above rules and is thus considered lexically assigned. In these cases the irregularly accented vowel is orthographically marked with an acute accent over the vowel.[25]

In a few Russian loans FD-rule IIB (see 3.3.2) fails to apply to a sequence of three light syllables in KP CA, so that FD-rule IIIB4 applies instead.

úk|'ulú|taq [úk.:u.lú:.taq] 'garden'; from Russian *ogoród (rather than*
**úk|'u|lutáq)*
pliís|taná|mi [plí:s˗ta.ná:.mi] 'on the wharf'; abs. sg. *pliís|tanáq* [plí:s˗ta.náq]
'wharf'; from Russian *prístan'*

These words are orthographically represented as *uk'ulútaq* and *pliistanámi*; note that *pliistanaq* requires no such marking on the last syllable, since the iambic foot is predicted by FD-rule IIIB4 here. One example has also been found of a loan from KA so marked in KP CA:

á|paá|sinú|men [áp.:á:˗si.ná:.mən] 'to the priest'; abs. sg. *á|paá|sináq*
[áp.:á: ˗si.náq] 'priest'; from KA *apaasinaq* 'big grandfather'

The foot definition in *apaasinámen*, irregular in CA, is quite regular in KA, *-sinaq* 'big N' being

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kitú|'ar|cęs|tęlléq|a [kitú:.ax.cə̨s.tə̨.ɬə́q.:a] 'the one which passed me (suddenly)'

Here we seem to find a sequence of two unaccented feet, elsewhere avoided because of the general constraint on such a sequence in CA (see 3.1), but in this case permitted apparently due to the more important constraint against accented voiceless Ce(C).

[25] This marking is also used for irregular vowel length in non-initial syllables (see 2.1, end), but since irregular vowel length and irregular accent are in complementary distribution, this ad hoc solution appears to be adequate.

a disyllabic postbase (see 4.1). The most plausible explanation here is that these words, including the Russian loans, were borrowed intact from Kodiak KA, complete with the KA accent pattern. A further peculiarity of such stems is that "velar dropping" (here, morphophonemic deletion of stem-final *r* between single vowels) does not occur after an irregularly accented light syllable. For example, in KP CA one says *áp|aá|siná|'ung|ráan* 'even though he is a priest' (by fricative dropping from *...aru...*) in place of **áp|aá|si|naúng|raán*. This would be the form in KA, where the postbase is not prosodically irregular (but it would mean 'even though he is a big grandfather').

Two postbases, *-q'ar-* (V→V) 'momentarily or involuntarily V' and *-yar-* (V→V, highly lexicalized) 'abruptly V', require that the preceding syllable be accented. If the preceding syllable would otherwise be light and not iambically accented, then there are two possibilities: if the vowel is full, the syllable becomes heavy (orthographically this is represented by doubling the vowel); if the vowel is *e*, however, the syllable is irregularly defined as an accented foot. Recorded cases of the latter are quite rare and may be considered lexicalized:

qetgéq'ar- 'hop' (from *qetger-* 'jump')
ceqméryar- (KP CA) 'slosh'; the base without *-yar-* is unattested.

Another rather obscure but nevertheless interesting irregularity found in KP CA is that the syllable *n'e* of the lexicalized morpheme combination *–n'éraar-*, which forms the negative concessive mood ('even though...not...'), has lexicalized accent. This is historically a contraction of **–n'e-lengraar-* (cf. CY *–nrilengrar-*). Since iambic accent on *n'e* is avoided by FD-rule IIIB1, the preceding syllable is always accented. In the uncontracted form **–n'elengraar-*, this would result in the syllable **leng* being iambically accented regardless of the preceding prosodic environment. When this syllable was dropped, its iambic accent became lexicalized as irregular accent on *n'e*. The following examples are marked for pitch level to illustrate the contrast with the negative intransitive participle and past tense formant *–n'engur-* (cf. CY *–nrilngur-*), where accent assignment is regular.

agén|²'*ér*|³*aár*|²*ma* 'even though I'm not going';
compare *agén*|²'*e*|¹*nguá*|²*nga* 'I didn't go'

ág|²*nguán*|³'*ér*|²*aár*|³*ma* 'even though I'm not dancing;
compare *ág*|²*nguán*|³'*e*|¹*nguá*|²*nga* 'I didn't dance'

Another exception to the general accent rules possibly related to the above is found in KP CA with the postbase *–n'ete-*. In this subdialect, if the syllable preceding *–n'ete-* or its allomorph is accented, a following light syllable may optionally be defined as an accented light foot:

nallún|'*e*|*tukút* [na.ɬún.:n̥ˈtu.kút] or *nallún*|'*e*|*tú*|*kut* [na.ɬún.:n̥ˈtú:.kut] 'we know'

The KA form is *nallún*|'*i*|*tukút*, corresponding to the (regular) first form given above. Thus this irregularity cannot plausibly be attributed to Kodiak influence, although it may be linked in some obscure way with the irregularity found with *–n'éraar-*.

Finally, there is a poorly attested and apparently optional rule in PWS CA which allows a word-final sequence of two light syllables to be defined as unaccented foot plus monosyllabic accented foot, rather than as a disyllabic iambic foot. This rule, if it could actually be considered a rule, would be ordered before FD-rule IIIB2, but since it is not fully understood it has been relegated to this section. In the examples found so far, the vowel of the word-final syllable, which is defined as a monosyllabic accented foot, is *e*.

cuú|*telék* [cú:ˈtɔ.lɔk] or *cuú*|*te*|*lék* [cú:.tɔˈlɔk] 'one that has ears'

sét|'a|lék [sɔ̀t.:a˧˥lɔ̀k] 'kelp sp.' (lit. one that has markings)
piúg|te|mék [piúx.tə˧˥mɔ̀k] 'from a dog'

It is not known if the last two examples have alternants with final iambic feet.

4. Accent-advancing in KA

Perhaps the most interesting feature of KA prosody is the morphologically determined marking of certain light syllables contained within suffixes as **accent-advancing**, based on either the phonological shape or the distributional category of the suffix. The assignment of iambic accent to an accent-advancing syllable which is both preceded and followed by light syllables is avoided in the environments specified by FD-rule IIC (see 3.3.3) by defining the preceding light syllable as an unaccented foot. This shifts the boundaries of the iambic foot rightward one syllable, so that the accent-advancing syllable heads the iambic foot. Thus, in a series of three light syllables where the second is accent-advancing, |S|SŚ| is found in place of |SŚ|S. This rule does not apply where there is an enclitic boundary between the second (accent-advancing) and third light syllables.

Accent-advancing syllables subject to rule IIC fall into two categories: (a) those that occur as the initial syllable of a disyllabic postbase (or a lexicalized combination of two monosyllabic postbases which together behave as a disyllabic postbase), discussed in 4.1, and (b) syllables found in the latter portion of the word, here called the **accent-advancing portion**, which is made up of inflectional endings and monosyllabic accent-advancing postbases immediately preceding inflectional endings or other such monosyllabic postbases, discussed in 4.2. Syllables containing the vowel *e* are treated by FD-rule IIA in KA; these are discussed in 4.3.

4.1. Disyllabic light postbases and postbase combinations

All known KA postbases of the form (C)CV(C)CV(C)-, where the second syllable does not contain the vowel *e* (here these are referred to as **disyllabic light postbases**) have accent-advancing initial syllables and non-accent-advancing second syllables. Thus, if the span of syllables to which the FD-rules are being applied consists of a light syllable plus an allomorph of a disyllabic light postbase both of whose syllables are light, the first light syllable is defined as an unaccented foot by FD-rule IIC(a), and the postbase is defined as an iambic foot by FD-rule IIIB2 (see 3.4.3). We use the disyllabic postbase *-sinaq* 'big N' to illustrate:

paá|ya|siná|qa [pá:.yá˧˥si.ná:.qa] 'my big pie'

If the span consists simply of an allomorph of a disyllabic light postbase both of whose syllables are light, the postbase is also defined as an iambic foot by IIIB2:

qayá|siná|qa [qa.yá:˧˥si.ná:.qa] 'my big baidarka'

These being the only two cases, we see that a disyllabic light postbase is always defined as an iambic foot by IIIB2 **unless** the vowel of the following suffix combines with the second vowel of the postbase to form a heavy syllable (in which case FD-rule IIIA must apply to the heavy syllable):

qayá|si|naá [qa.yá:.sí˧˥ná] 'her big baidarka'
paá|yasí|naá [pá:˧˥ya.sí:˧˥ná] 'her big pie'

In the last example, the sequence *yasi* must be defined as an iambic foot by IIIB2. The number of light syllables under consideration is only two, and FD-rule IIC(a) does not apply (this would yield **paá|ya|si|naá*). The "accent-advancing" nature of the initial syllable of *-sinaq* is overridden by this

constraint.

(Henceforth, I will omit the phonetic transcriptions in brackets.)

Following is a list of the disyllabic postbases so far attested in KA:[27]

–cagaq (N-N) 'little N'
–culngu- (V-V, unproductiv[illegible] 'be sick to the point of V-ing'
+cunite- (N-Vintr) 'smell [illegible]e N'
–curlag- (V-V) 'V unsatisfactorily, with disastrous results'
+ka(r)sur- 'look for something to use as N'
*–**k**utar-* (V-V) 'be going to V'
–llkegci- (V-V) 'enjoy V-ing'
–llqutaq (N-N) 'old N'
+nayar- (V-V) 'could, would, might V'
–nercir- (Vintr-Vtr) 'wait for S to V'
–nerkite- (V-V) 'V little, insufficiently'
–nerllugte- (V-V) 'V poorly'
–nertu- (V-V) 'V a lot, proficiently'
–ngayag-, –ngacag- (V-V) 'V in a strange or frightful way'
+nginar- (V-V, with conjunctive moods) 'not until, only when'
+pakaq (N-N) 'too much/many N'
+w/pakar- (V-V) 'V too much, so much'
+w/paluq (fossilized, found in a few nouns)
+w/payar- (V-V) 'nearly V'
–qaci- (V-V) with subordinative endings) 'as S is V-ing'
*–**q**anir-* (V-V) 'V a little more/further'
*–**q**atar-* (V-V) 'be in process of V-ing, V progressively'
*–**q**ullug-* (V-V) 'be fortunate enough to V'
*–**q**utaq* (N-N) 'plant or bush of N (berry, flower)'
–sinaq (N-N) 'large N'
+taciq (V-N) 'fact of V-ing (to such an extent), extent of V-ing'
+tuliq (N-N) 'one with much N'
+tuqaq (N-N) 'group of N'
+yartur-, +yatur- (V-V) 'go in order to V'
+yagute-, +ya'ute- (V-V, restricted) 'come to V'
+yugnar-, +yunar- (V-V) (a) 'probably V'; (b) 'be prone to cause V-ing'
+yugnga- (V-V) 'could possibly V'

Note that most of the above postbases are of the form CVCV(C). A few postbases originally of the form CVXCV(C) (where X is *g* or *r*) either have lost X (i.e. KA *+cunite-*, CA *+cugnite-*) or are in the process of losing it (i.e. KA *+ya(r)tur-* and *+yu(g)nar-*). It thus appears that these postbases are in the process of becoming normalized to the shape CVCV(C), where the initial syllable (accent-advancing and thus predominantly unaccented) has assumed the weakest possible syllabic shape.

Lexicalized combinations of two monosyllabic postbases, the first of which is accent-advancing (see 4.3) and the second of which is not, behave prosodically like disyllabic postbases. Those included in the list above range from obvious and recently lexicalized combinations, most notably

[27] The joining types of postbases are summarily indicated here. The **minus** sign indicates that base-final *g, r* (word-finally appearing as *k, q*) are dropped; the **plus** sign indicates that they are not, although a morphological process called **velar-dropping** may result in their deletion between single vowels. A **bold** velar or uvular postbase-initial consonant following the minus sign is assimilated to base-final *g, r*, which drops. Postbases beginning with *w/p* have *w* following a vowel and *p* following a consonant or base-final *te*, which drops. Note also that (post)base-final *e* is not counted as syllabic; thus *+yagute-* is considered a disyllabic postbase.

+ka(r)sur- 'look for (*+sur-* or *–sur-*) something to use as N (*+kaq*)', to older combinations, which are often found with the same or similar meanings and/or functions in other Eskimo languages.

Most but not all of these postbases have been verified as having accent-advancing initial syllables in all KA. Several of them are treated as disyllabic in Perry KA but as two monosyllabic postbases elsewhere in KA. In Perry KA, for example, we find a minimal pair with regard to accent-advancement:

Castun akí|tutá|ciqá? 'How expensive will it be?'
Nallugaa akí|tu|tací|qa. 'He doesn't know how rich I am.'

Both of these are based on the stem *akitu-* 'be expensive; be rich'. In the first, the non-accent-advancing postbase *+ta-* 'V to such an extent', *+ciqe-* 'future', and the 3.sg. intrans. interrogative ending are added. In the second, the postbase *+taciq* 'fact of V-ing to such an extent' and the 1.sg. possessed noun ending are added. The postbase *+taciq* is historically a combination of *+ta-* plus *+(u)ciq*, now treated as a disyllabic postbase in Perry KA, with the result that the syllable *ta* is accent-advancing in the first example but not in the second. Elsewhere in KA, this combination of postbases is still treated as two separate morphemes, so that the two words are homophonous *(akítutáciqá)*.

A similar case is *+tuliq*, found especially in animal and place names, historically a combination of *+tu-* 'have much N' (which occurs in *-nertu-* above) and *+li(q)*, a nominalizing postbase; neither of these is accent-advancing. Compare

Qáng|yu|tulíq 'Ivanoff Bay' (lit. 'one with many swells')
qawá|nertú|li 'one who sleeps a lot'

Another instance of dialect variation in accent-advancement is seen with the allomorphs *+uma-*, *+-ima-* of the so-called non-witnessed postbase and the allomorph *+uma-* of the stative postbase. In all KA, the allomorph *+uma-* of the stative postbase 'be in a state resulting from V-ing' is treated as a disyllabic postbase; the accent-advancing syllable is composed of the final consonant of the preceding base plus the first vowel (*u* or *i*) of the postbase. In KA outside of Perryville, the allomorphs *+uma-*, *+ima-* of the non-witnessed postbase 'V not witnessed by speaker' are treated identically. In Perry KA, however, both syllables are accent-advancing (see following sections). Note, moreover, that this postbase is not of the form (C)CV(C)CV(C)-.

The formant of the negative subordinative verb mood affords an extreme example of dialect variation. This morpheme has the following allomorphy (with the form occurring after a base-final vowel separated by a slash from the form occurring after a base-final consonant): (modern Kodiak and most modern AP) *+gkuna-*/*+kuna-*, (older Kodiak, as attested in the Gospel of Matthew and other religious translations) *+gkuna-*/*+pekuna-*, (older Perry) *+gkwena-*/*+pe̥kena-*, (older GAP) *+fkena-*/*+pe̥kena-*. In Kodiak and Perry KA, all syllables of this formant are accent-advancing. In GAP KA, however, the syllable *na-*is not accent-advancing, so that this and the preceding syllable together act like a disyllabic postbase with respect to accent-advancement. Compare, for example

calíg|ku|naní (Kodiak, Perry), *calíf|kená|ni* (GAP) 'without his doing anything'
atúr|ku|naní (Kodiak, Perry), *atúr|pe̥|kená|ni* (older Perry, GAP) 'without his singing'

Note that the syllable spelled *kwe* in the Perry KA variant *+gkwena-* appears to be phonetically indistinguishable from *ku*, but its vowel does not lengthen when accented; rather, it causes

the following consonant to be geminated (as also occurs following voiced *e*), as for example in *iq|llugkwén|ii* 'without my lying'. I do not have data on this point for the rest of KA, but in CA the vowel of *+(g)kuna-* may be lengthened like any other *u*.

4.2. The accent-advancing portion of the word

The second environment where accent-advancing occurs, here called the **accent-advancing portion of the word**, is more difficult to describe succinctly and is moreover characterized by greater dialect diversity and apparently more free variation than is the case with disyllabic postbases. In general, however, the accent-advancing portion of the word is composed of the inflectional endings together with certain monosyllabic postbases immediately preceding the ending or other such monosyllabic postbases. Many of these monosyllabic postbases have distributional restrictions on their co-occurrence with inflectional endings and with one another, and express grammatical features such as tense and status. Typically, the suffixation of one of these postbases to a base does not result in a lexicalized derivative. In contrast, some of the disyllabic postbases discussed in 4.1 typically form lexicalized derivatives, but others do not.

In practice, the delimitation of the accent-advancing portion of the word is complicated by the fact that accent-advancing according to rule IIC applies only to a sequence of three light syllables of which the first two do not form a disyllabic postbase, and furthermore (for most KA) only where the third syllable of such a sequence does not contain *e*, and for some speakers also only where the second syllable of such a sequence is open. These qualifications on the applicability of rule IIC considerably restrict our ability to generalize about the typology of postbases and postbase combinations where accent-advancement occurs and often makes it difficult to find illustrative examples which do not sound artificial or awkward when elicited. Furthermore, accent-advancement with monosyllabic postbases and endings is difficult to describe because of the amount of dialect variation and/or seemingly free variation within the same dialect or for a single speaker. The ideal way to gather data on particular points, e.g. where a speaker admits variant pronunciations or seems internally inconsistent, would be to go over recorded texts for spontaneous examples. Unfortunately, however, the quantity of recordings made to date is not adequate to document the particular combination of morphemes which one would like to observe in context. Moreover, some dialects have been less thoroughly checked than others, particularly with regard to the finer points, so full treatment for all KA is not possible here.

An important restriction on accent-advancement (to which I have a few recorded exceptions from Perryville) is that it fails to occur where the third of the sequence of three syllables under consideration is of the form C*e*(C).[28]

Another environment where dialectal variation in accent-advancement has been particularly difficult to pin down is where the syllable from which accent is to be advanced is closed and voiced. The general rule for GAP and some Kodiak KA (and sporadically also in Perry KA) is that accent-advancement fails to occur if the second of the three light syllables under consideration is closed, but in some Kodiak KA and as a rule in Perry KA accent-advancement occurs whether or not the second syllable is closed. Thus in forms like

[28] I am not certain whether the lone exception to this rule I found in Perryville should be taken to represent the original pattern from the northern Shelikoff Strait AP people (or perhaps of a certain subgroup of them) which has subsequently been largely replaced by the GAP/Kodiak pattern. The following word was heard twice in succession in the spontaneous speech of Fr. Hariton, one of the oldest Perryville speakers:

kás|ai|cęs|tarpęk|ut [kás.:aí:.cəs÷tax.pə́k.:ut] 'you are causing us to lack a priest',
versus *kás|ai|cęstár|pękut* [kás.:aí:÷cəs.táx÷pə.kut] from other speakers.

Fr. Hariton's pronunciation as I heard it could not be reelicited from other speakers; they gave the second form above. The gemination of *k* after voiceless *e* is particularly interesting—gemination following accented voiceless *e* has not otherwise been attested in KA, because accented voiceless syllables occur only in initial feet, where they are always closed. Fr. Hariton's pronunciation of this word is in fact identical with that found in CA, except that in CA, this *e* is voiced.

iq|llunill|kiná (GAP, some Kodiak), *iq|llu|nillki|na* (Perry, some Kodiak)
'don't lie (in future)'
iq|llukúg|cikút (GAP, some Kodiak, attested once in Perry), *iq|llu|kugci|kut* (Perry, some Kodiak) 'if you (pl.) lie to us'

we find that speakers tend to use one form but may accept the other as also valid, whereas with

iq|llu|nilú (GAP, Kodiak), *iq|llu|nillú* (Perry) 'don't lie (at present)'
iq|llu|kuní|kut 'if he (refl.) lies to us'

accent-advancement is the rule.

In a recent field trip to Perryville, I made a serious attempt to uncover the principles underlying accent-advancement. I found, however, that in some cases the results vary from speaker to speaker or even with the same speaker. It may be that this variation has existed for some time as a result of an ongoing restructuring of the rules or conflicting rules. More likely, however, at least some variation is due to influence from Chignik and Mitrofania Village, a number of whose residents moved to Perryville when Mitrofania Village was depopulated in the first part of this century.

Accent-advancement is more prominent in Perry KA than in the rest of AP KA, and to some extent more than in Kodiak KA. This is hardly surprising in view of the fact that in CA (which begins just across the Cook Inlet from Asiwak, whose inhabitants moved to Perryville) accent-advancement is generalized to all sequences of three light syllables.

In the following section I will attempt to describe the Perryville pattern of accent-advancement; the reader should keep in mind, however, the position this dialect occupies and the fact that this dialect probably does not derive from a homogeneous source. We begin with the simpler case of nouns.

4.2.1. Nouns

The accent-advancing portion of a noun includes the inflectional ending and in some cases also a monosyllabic postbase immediately preceding this ending. Postbases which belong to the accent-advancing portion of the word if they immediately precede the ending are called **accent-advancing postbases**. With noun bases, the number of such postbases is small, and moreover some of these are only optionally accent-advancing in Perry KA. The members of this set so far attested in Perry KA are all N → N postbases, some of which are typologically similar to the verbal accent-advancing postbases discussed in the following section.

+ *kaq* 'future N'
– *kcak* 'small amount of N'
– *lek* 'one which has N'
– *lleq* 'former N'
– *nku-* ~ + *ku-* (with dual and plural endings only) 'N and another, N and others' (with N)

It is difficult to formulate a single rule for the treatment of these postbases because of differences in their shape and distribution and variation in attested accent. The postbase + *kaq* is treated as optionally accent-advancing before an ending:

éng|lur|kaqá, éng|lurká|qa 'my future house'
éng|lur|kamí|nek, éng|lurká|minék 'from his future house'

When followed by other postbases, + *kaq* is not usually accent-advancing:

éng|lurká|sinaq 'big future house' (*–sinaq* 'big N')
éng|lurká|lek 'one who has a future house' (*–lek* 'having N')
éng|lurká|nguq 'he got a future house' (*–nge-* 'acquire N')
éng|lurká|lleqá 'my former future house' (*–lleq* 'former N')

An exception to this generalization is the combination *+ka(r)sur-* (*+kaq* plus *+(sur-)*, where the syllable *ka(r)* is accent-advancing. Since this does not appear to be the usual result with *kaq* before another postbase, but rather like a disyllabic postbase, we consider this to be a lexicalized postbase combination (see 4.1):

éng|lur|ka(r)súr|tuq 'she is looking for something to use as a house'

The postbase *–lleq* appears to be optionally accent-advancing before an ending, like *+kaq*, but since the vowel *e* is frequently voiceless in this ending, its prosodic behavior can not be ascertained with certainty:

éng|lu|lleqá 'my former house'
éng|lu|llermí|nek, *éng|lullér|minék* 'from his former house'

In the first example, as we will show in 4.3, accent on *lle* is avoided because *e* is voiceless. Therefore, only one variant is found, but in the second example, where *e* is voiced, either result is possible.

These postbases, *+kaq* 'future N' and *–lleq* 'former N', parallel accent-advancing postbases and endings which mark tense in verbs (see 4.2.2.1). This can most clearly be seen in their use with the postbase *+(u)ciq* (also accent-advancing in most KA), which forms a kind of verbal noun:

Nallugaa agú|ciqá. 'He doesn't know that I'm going.'
Nallugaa agú|cir|kaqá. 'He doesn't know that/whether I'll go.'
Nallugaa agú|ci|lleqá. 'He doesn't know that I went.'

The postbase *–nku-* ~ *+ku-* is evidently cognate with the demonstrative suffix *+ku-*, which likewise is used only with dual and plural endings. Postbases of this type, which are restricted distributionally to occurrence with certain types of endings, we will call **ad-inflectional** postbases, implying a closer relationship with the inflection than with the base to which they are suffixed. This label is perhaps most useful in describing a number of verbal postbases (see 4.2.2). The postbase *–nku-* ~ *+ku-* has been attested only as accent-advancing:

maá|man|kunún 'to Mom and those with her'

The postbases discussed so far, then, may be said to parallel in one way or another the verbal accent-advancing postbases. The postbase *–lek* 'one which has N', however, is not readily comparable with any verbal accent-advancing postbase. This postbase functions suppletively for the combination of the postbase *–ngqerte-* (N → V) 'have N' plus the intransitive participial ending *–llria* (and variants). This postbase has been attested as accent-advancing only in Perry KA:

éng|lulék 'one who has a house' (suppletive for **englungqertellria*)
éng|lu|legmék (Perry KA), *éng|lulég|mek* (Kodiak and GAP KA) 'from one who has a house'

One further environment where accent-advancement has been found in nouns is where the noun base ends in *te-* and an inflectional ending begins with avoiced segment, resulting in a syllable

containing voiced *e*. Here accent-advancement is apparently optional (at least in AP KA) where the syllable is closed. Attested forms are

áp|ru|tenká, *áp|rutén|ka* 'my trails'
áp|ru|temkún, *áp|rutém|kun* 'by way of my trail(s)'

Accent-advancement involving syllables containing the vowel *e* is further discussed in 4.3.

4.2.2. Verbs

The accent-advancing portion of a verb potentially occupies a greater part of the word than that of the noun. The reason for this is that where more than one accent-advancing postbase is morphologically contiguous to the ending, they are all included in the accent-advancing portion of the word. The accent-advancing portion of nouns, on the other hand, has not been found to extend further left than the syllable immediately preceding the ending. This fact is most apparent in Kodiak and Perry KA, where the number and variety of accent-advancing postbases is greater than in GAP KA. In the discussion of these types of accent-advancing postbases, it should be kept in mind that only postbases composed of light syllables (sometimes more than one light syllable) are relevant to the subject of accent-advancement; thus not all postbases of a given category are included in the discussion.

4.2.2.1. Ad-inflectional and tense-status postbases

In verbs, accent-advancing postbases belong to a number of distinguishable categories, which we shall call the **ad-inflectional**, **tense-status**, and **imputative** types. Discussion of the imputative type postbases will be set off in section 4.2.2.2, since their prosodic behavior is quite complex and exhibits considerable apparently free variation.

The ad-inflectional type postbases always precede endings; there are two subtypes—the V-N subtype, which forms participles and verbal nouns and must immediately precede nominal endings, and the V-V subtype, which is distributionally restricted so that each occurs only immediately before verbal endings of a specific inflectional category. Thus, an ad-inflectional postbase and the inflectional ending associated with it together form an inseparable unit, so that it is sometimes most convenient to refer to the ad-inflectional postbase as the initial segment (or formant) of the ending. The V-V ad-inflectional postbases which exhibit accent-advancement are

+*w/pag-* (with interrogative) 'surely V (a lot); V so much'; also used as a narrative tense of immediate sequence: 'and then S V-ed'
–**k***i*- (with optative) future optative
+*na*- (with subordinative) future subordinative

and the following, which all occur with a distinctive set of endings, and are usually considered ending formants rather than postbases:

+*nga-*/+*ya*- (consequential): 'when S V-ed', 'because S V-s or V-ed'
–**k***u*-/–**k***a*- (conditional): 'when S V-s (in future), if S V-s'
+*(g)aqa*- (contingent): 'when S V-s (habitually), whenever S V-s': both syllables accent-advancing in Perry and Kodiak KA but not GAP KA
–*ng'er*- (Kodiak –*ng'ar*-)/–*ngraa*- (concessive): 'even though S V-s, even if S V-s'

The dialect variation found with these postbases and those to be given below is quite complex. The postbase +*na*- is generally accent-advancing, but apparently only optionally so in GAP KA. With the postbase +*(g)aqa*-, both syllables are accent-advancing in Perry and Kodiak KA, but in

GAP KA, the first syllable is not accent-advancing and the second syllable is. In the following examples we illustrate this dialect variation, as well as the variability in accent-advancement found with closed syllables (see 4.2 for discussion of this point):

ikáⁱ|yur|pagtáⁱ|nga (Perry, sometimes Kodiak), *ikáⁱ|yurpáⁱg|tangá* (GAP, sometimes Kodiak) 'and then he helped me' or 'he sure helped me'
ikáⁱ|yu|qikí '(you sing.) help them (in future)'
ikáⁱ|yur|nalú|ku (GAP also *ikáⁱ|yurnáⁱ|lukú*) 'so he'll help her'
ikáⁱ|yu|quní 'if he (refl.) helps'
ikáⁱ|yu|qunî|kut 'if he (refl.) helps us'
ikáⁱ|yu|qugcí (Perry, sometimes Kodiak), *ikáⁱ|yuqúg|ci* (GAP, sometimes Kodiak) 'if you (plur.) help'
ikáⁱ|yu|qugcí|kut (Perry, sometimes Kodiak), *ikáⁱ|yuqúg|cikút* (GAP, sometimes Kodiak) 'if you (plur.) help us'
ikáⁱ|yu|'aqá|ma (Perry, Kodiak), *ikáⁱ|yurá|qamá* (GAP) 'whenever I help'
tuqú|ta|qamí|ki (all) 'whenever he (refl.) kills them'
tuqú|ta|qamkí (Perry, sometimes Kodiak), *tuqú|taqám|ki* (GAP, sometimes Kodiak) 'whenever I kill them'

The accent-advancing V-N ad-inflectional postbases are

–k*engaq* (transitive participle, possessed) 'one which is V-ed by P (possessor)': accent-advancing only in Perryville.
–lleq (perfect participle) 'one which V-ed'; (possessed) 'one which was V-ed by P'
–sqaq/ + lnguq (participle of descriptive verbs) 'one which V-s'
–neq/ + lleq (comparative participle of descriptive verbs, always possessed): 'one which V-s more than P'
–neq/ + lleq (verbal noun) 'act or event of V-ing'; (possessed, with one of the local cases) 'time of P's V-ing'
+ (u)ciq (verbal noun) 'fact or way of V-ing': both syllables accent-advancing in Perry and Kodiak KA and optionally also in GAP KA
+ (u)te- (possessed, with locative case) 'as soon as P V-s'
+ nate- (possessed, with or without terminalis case) 'until P V-s'

The main syllable (i.e. the portion not enclosed in parentheses) of the postbases *+ (u)te-*, *+ (u)ciq*, and *+ (u/i)ma-* (below) is accent-advancing when it forms a light voiced syllable in Perry and Kodiak KA. When the vowel in parentheses occurs and does not form a vowel pair with the last stem vowel, both syllables containing this postbase are accent-advancing. In GAP KA, the main syllable of *+ (u)ciq* appears from my data to be optionally accent-advancing. Also a puzzling observation from my data is that in GAP KA, whereas *+ na-* is not attested as accent-forwarding, the related postbase *+ nate-* apparently is. Both syllables of the postbase **–k***engaq* are accent-advancing in Perry KA, but in the rest of KA this postbase behaves prosodically like a disyllabic postbase.

Like the N-N postbases illustrated in section 4.2.1, these V-N postbases do not appear to be accent-advancing when they are followed by the N-N postbases *+ kaq* (future) and *–lleq* (past).

atú|qe|ngaqá (Perry), *atú|qengá|qa* (Kodiak, GAP) 'what I am using'
atú|qengár|kaqá (all) 'what I am to use'
akí|tus|qamék 'an expensive one (abl.)'

ayú|qu|ciqá (Perry, Kodiak), *ayú|qucí|qa* **or** *ayú|qu|ciqá* (GAP) 'my appearance, what I look like'
ayú|qucír|kaqá (all) 'what I will look like'
ayú|qucí|llęqá 'what I looked like'
ikú|yur|natén 'until (she) helps you' (but compare GAP *ikú|yurnú|lukú* above)

The tense-status type postbases precede (not necessarily immediately) this complex of adinflectional postbase plus ending. Some of these are ordered with respect to the others. The rightmost is

–n'ite- (most KA), *–n'ete-* (some Kodiak KA) (negative): accent-advancing in Perry and Kodiak.

This is preceded by

+(u/i)ma- (non-witnessed): both syllables accent-advancing in Perry and Kodiak; first syllable accent-advancing in GAP KA.

The above are preceded by the following, none of which have been found to co-occur:

–llru- (perfect): accent-advancing only in Perry KA (except in combination with another postbase, see below)
+ciqe-/ +ciiqe- (future):[29] first variant accent-advancing in all KA,

together with their negative counterparts **–k***saite-* (perfect negative) and *+ningaite-* (future negative), and the postbase *+taar-* (habitual). These, however, are not involved in accent-advancement because they contain heavy syllables.

The differing prosodic treatment of *–llru-* and *+ciqe-* is hard to account for. Whereas *+ciqe-* is accent-advancing in all KA, *–llru-* is accent-advancing only in Perry KA. However, the combination *–llru-ma-* (perfect non-witnessed) behaves as a disyllabic postbase in all KA; the first syllable *(ru)* is accent-advancing, whereas the second *(ma)* is not. The combination *–llru-n'ite-* (perfect negative) appears to be marginally acceptable to some speakers. Here also *ru* appears to be accent-advancing. However, this combination has not been attested in spontaneous speech; the postbase **–k***saite-* (perfect negative) is used instead. The combination *+ciq-uma-* (future non-witnessed) is also accepted by speakers but is probably infrequently used; accent-advancement from *ci* to *qu* in this combination has been attested in Perry KA but not in GAP KA. The combination ** +ciqe-n'ite-* (future negative) does not occur; *+ningaite-* is used instead.

iq|llu|nitúq (Kodiak, Perry), *iq|lluní|tuq* (GAP) 'she's not lying'
iq|llu|nillkí|na (Perry, sometimes Kodiak); *iq|llunill|kiná* (GAP, sometimes Kodiak) '(you sing.) don't lie (in future)'

táng|rru|malú|ku (Kodiak, Perry), *táng|rrumá|lukú* (GAP) 'apparently seeing it'
lií|ta|qumá|lukú (all) 'apparently recognizing him'

[29] KA, stem final *e* usually drops before this postbase unless a three-consonant cluster would otherwise result. (Dialect-internal variability has been found on this point.) Compare *tuyúq|ci|qaqá* 'I will send them' and *míng|qe|ciqá|qa* 'I will sew it' (stems *tuyuqe-* and *mingqe-*). In CA (as usually in CY), the rule here is more complex: stem-final *e* drops only following a voiced nasal. Thus the CA forms of the above words are similarly parsed: *tuyú|qe|ciqá|qa* and *míng|qe|ciqá|qa*.

ikâ|vullrú|lukú 'having helped him'
ikâ|vull|rumâ|lukú 'apparently having helped him'

ikâ|yur|ciqâ|qa 'I will help him'
ikâ|yur|ciqllú|ku (attested in Perry only) 'intending to help him' (rough translation)

4.2.2.2. Imputative type postbases

The imputative type postbases are a subset of a class of postbases which are called "compound-verbal postbases" in *Yup'ik Eskimo Grammar* (Reed et al., 1977:232-237); these might alternatively be called "embedding type postbases." These postbases occupy a unique niche in word formation. They correspond functionally to what are, in most languages, verbs that take clauses as objects.[30] It is apparent that in KA these embedding type postbases are to be subdivided into two subtypes: those that denote causation (*+ceste-* and *+gkwar-* 'cause V-ing to occur' and *+sqe-* 'request/desire that V-ing occur'), and what I call the imputative type (given below). Of the causational subtype, only *+gkwar-* contains a full vowel (not *e*) and could exhibit accent-advancement, but it does not. The members of the imputative subtype are

+ni- 'say that V-ing occurs'
+yuke- 'think that V-ing occurs'.

Tense-status postbases precede the imputative postbase where they modify the "embedded" verb (e.g. *ikayurciqnigaa* 'she says she'll help him') and follow the imputative postbase where they modify the resulting derived verb (e.g. the elicited form *ikayurniciqaa* 'she will say she's helping him'—such forms rarely if ever occur in normal speech). The combination of *+ciqe-* (future) plus *+yuke-* does not occur as such; instead either *+naur-* (Kodiak, Perry KA) or *+na-* (GAP KA, as also in CY) replaces *+ciqe-* as a suppletive indicator of futurity, giving *+nauryuke-* or *+nayuke-* 'think that V-ing will occur'.

Accent-advancement sometimes occurs with these imputative postbases, together with the tense-status postbases *–n'ite-* (negative), *–llru-* (perfect) and *+ciqe-* ~ *+na-* (future) when these precede the imputative postbases. However, much apparently optional variation has been found in all dialects, and I have so far been unable to find a satisfactory rule for predicting whether accent-advancement will occur for the forms obtained, even if I limit the scope of the model to predicting the results I obtained from only one speaker of a given variety of KA.

In Perryville, these imputative postbases are usually accent-advancing unless followed by a monosyllabic ending. In GAP and perhaps also in Kodiak KA, both the imputative postbase and preceding *–llru-*, *+ciqe-*, or *+na-* are usually accent-advancing unless followed by a monosyllabic ending. I can offer no satisfactory explanation for these observations, nor are they valid for all the examples obtained. They are simply the only observations I can make at this time. Some examples:

ikâ|yurní|ken 'you said he was helping', or 'you said he was being helped'
ikâ|yur|nilú|ku 'saying he was helping (being helped)'

ikâ|vullrú|nikén (GAP, Kodiak), *ikâ|vull|runí|ken* (Perry) 'you said he had helped (been helped)'
ikâ|vull|runí|lukú 'saying he had helped (been helped)';

[30] In Eskimo languages, the patient (nominal argument which if overt is in the absolutive case) of the embedded clause is also the patient of the resulting derived clause; the agent (relative case) of the embedded clause is the indirect agent (terminalis case) of the derived clause. The remaining argument is the subject of the derived clause, which is the agent unless the object is coreferential with the subject, where it is the patient, and the derived verb is intransitive.

but

iwáll|runí|ken 'you said (he) had gone to get it'
iwáll|runí|lukú (GAP), *iwáll|ru|nilú|ku* **or** *iwáll|runí|lukú* (Perry, Kodiak) 'saying (he) had gone to get it'

Compare also the following three forms from GAP KA:

ikú|yurnú|yukán 'you think he will help (be helped)'
ikú|yur|nayú|kaqá 'I think he will help (be helped)'
ikú|yur|nayúk|llukú 'thinking he will help (be helped)'

Here *+(g)an* (2.sg.-3.sg.) is monosyllabic and *+(g)aqa* (1.sg.-3.sg.) and *+luku* (-3.sg.) are disyllabic; these forms thus support the observation made above: accent-advancing from *+na–* occurs where the inflectional ending has more than one syllable. However, other forms from the same speaker exhibit greater variability:

ikú|yullrú|yukán **or** *ikú|yull|ruyú|kan* 'you think he has helped (been helped)'
ikú|yull|ruyú|kaqá 'I think he has helped (been helped)'

Thus, although much variability is found with these postbases, we observe that accent-advancement occurs to some degree in all dialects of KA. In no dialect are they found to be either always accent-advancing or never accent-advancing.

4.3. Accent-advancement involving *e*

4.3.1. Base-final voiced *e*

At the end of 4.1 we saw that final *-ie-* of noun bases may be included in the accent-advancing portion of the noun. This appears to be related to another phenomenon found to occur in AP KA (including Perryville) and optionally in Kodiak KA, also not fully researched, which can preliminarily be stated as follows: when certain dropping-type monosyllabic postbases (see note 27 for discussion of joining types) are suffixed to a base ending in C*e-*, and the base-final *e* is neither dropped nor devoiced in the resulting combination, then the (voiced) syllable containing the base-final *e* is accent-advancing. Thus, if the monosyllabic postbase is not accent-advancing, the combination of this syllable and the following syllable (which contains the monosyllabic postbase) behaves like a disyllabic postbase. Postbases with which this type of accent-advancement has been observed are

–n'ir- (V-V) 'stop V-ing'
–n'ite- (V-V) 'not V'
–ngnaqe- (V-V) 'try to V'

Examples of accent-advancement with the base *qup'arte-* 'break' (note the degemination of *–n'ir-* and *–n'ite-* following an unaccented syllable):

qúp|'ar|tenír|tuq 'it stopped breaking'
qúp|'ar|tení|tuq 'it's not breaking' (Kodiak KA also *qúp|'artén|'itúq*)
qúp|'ar|tengná|quq 'it's trying to break' (Kodiak KA also *qúp|'arténg|naqúq*)

Note that of the V-V postbases, *–n'ite-* is accent-advancing in Kodiak and Perry KA, whereas

the other two are not:[11]

pit|'e|nitúq (Kodiak, Perry), *pit|'enít|tuq* (GAP) 'he didn't catch any' (e.g. fish)
pit|'enír|tuq (all) 'he stopped catching' (fish)
pit|'engná|quq (all) 'he's trying to catch some'

The postbase *–nku-* ~ *+ku-*, also accent-advancing, does not behave like *–n'ite-* with respect to preceding *e* in the one example obtained:

naá|qistén|kunún 'to the reader and those with him' (rather than **naá|qis|tenkú|nun*)

Note also the following form obtained for the non-syllabic postbase *–nge-* 'obtain N', which does not exhibit accent-advancement:

áp|ruténg|ut [áp.ɣu.tə̀ŋ.ŋut] 'they got a road'

4.3.2. Voiceless and quiescent *e*

4.3.2.1 The phonetic properties of quiescence

We saw in the preceding section that accent-advancement from voiced *e* may occur preceding a monosyllabic postbase. With disyllabic postbases, however, we have seen in 4.1 that the first syllable of the postbase is never accented unless the second syllable contains a vowel pair because of suffixation. When a disyllabic postbase is suffixed to a base ending with a syllable containing *e*, therefore, we would not expect accent-advancement from the syllable containing *e*, since this would cause iambic accent to fall on the first syllable of the disyllabic postbase. With the postbase *–sinaq* 'big N' suffixed to *tuqulineq* 'dead alder', *aprute-* 'road, trail', *ek'arneq* 'fallen-in place, depression', *naaqiste-* 'reader', I obtained the forms given below in Perryville, cross-checking them with several speakers:

[tu.qú˗lin̥ə́s.:i.náq] **and** [tu.qú.lín˗si.náq] 'big dead alder'
[ék.:aɣ.nə́s.:i.náq] **and** [ə́k.:áɣ.nᵊ˗si.náq] 'big depression'
[áp.ɣút˗si.náq] 'big road'
[ná:.qís.tə˗si.náq] 'big reader' (recall here that [tə̥] sounds like *t* released with aspiration.)

These forms are prosodically interpreted as follows:

tuqú|línés|ináq **and** *tuqú|li|ne|sináq* **or** *tuqú|lin|sináq* 'big dead alder'
ék|'arnés|ináq **and** *ék|'ar|ne|sináq* 'big depression'
áp|ru|te|sináq = *áp|rut|sináq* 'big road'
naá|qis|te|sináq 'big reader'

The first variants of *tuqulinesinaq* and *ek'arnesinaq* were given when I asked speakers to pronounce the word carefully. The second is probably more common in casual speech. Outside of Perryville, only the second variant of *tuqulinesinaq* (i.e. that which could be written *tuqulinsinaq*) has been attested; the first variant has not. Conversely, outside of Perryville the first variant of *ek'arnesinaq* has been attested, but the second has not. What does this complex set of data reveal?

The reason the data are so complex is that there are two interrelated phenomena illustrated

[11] See also 4.3.1 for stress-advancing from stem-final *e* preceding *–n'ite-*.

here: FD-rule IIA, which deals with voiceless and quiescent *e*, and the neutralization of contrast between |XV|C*e*| and |XVC|, where *e* is voiceless or quiescent. Turning first to FD-rule IIA, we reproduce it here (from section 3.3.1):

|XV(C) → |XV(C)|/__Ce(C). *or* /__Ce., *where* e *is quiescent*

In the case of *aprutesinaq* and *naaqistesinaq*, where *e* is voiceless, this rule must apply in the second cycle of foot definition, and in the third cycle rule IIIB2 applies, giving *áp|ru|te|sináq* and *naá|qis|te|sináq*.

In the case of *tuqulinesinaq* and *ek'arnesinaq*, however, *e* may or may not be quiescent, depending on how deliberately the word is pronounced. If *e* is not quiescent, the sequences *line* and *'arne* are defined as iambic feet by FD-rule IIIB2, so that *ne* is stressed and closed with the geminate of the initial consonant of the following syllable (by PA-rule 2; see 1.3.3). If *e*-quiescence occurs, however, these sequences are defined as two unaccented feet as in the above words where *e* is voiceless.

The second principle illustrated here is the neutralization of contrast between |XV|C*e*| and XVC|, where *e* is voiceless or quiescent. As pointed out in section 2.4, there is simply no possibility of phonetic contrast in such cases. The underlying form of 'big road' is *aprutesinaq* (i.e. this form is that generated by the application of the morphophonemic rules), but a linguist-observer or native writer ignorant of the structure of the word would quite justifiably transcribe this word as *aprutsinaq*, since there is nothing phonetically or prosodically detectable which would suggest the presence of voiceless *e*. With this word we could compare *liitaqnayaraanga* 'he could recognize me', prosodically *lii|taq|nayá|raá|nga*, where *e* is not underlyingly present between *q* and *n*. Prosodically the first four syllables of this word are identical with those of *áp|rut|sináq*.

Under what circumstances, then, does *e*-quiescence take place, resulting in the neutralization illustrated above results? A definitive answer cannot yet be given, but generally speaking, *e*-quiescence occurs in the sequence C*e*.C where both consonants are continuants, and possibly also where the first consonant is a stop and the second a homorganic voiced continuant (compare also the examples of *e*-quiescence in 2.4). Where the first consonant is a stop and the second a heterorganic voiced continuant, on the other hand, *e*-quiescence does not occur, as the examples under PA-rule 2 (section 1.3.3) show. Compare for example

Agá|yutém|aang 'O my God' (not *Agá|yu|te|maáng* = *Agá|yut|maáng*)
agá|yu|tę|kaí = *agá|yut|kaí* 'they are his ikons'
agá|yu|telég|mek 'from one who has ikons'

Note that *e*, although quiescent, cannot be omitted in the last form; **agá|yut|lég|mek* is not a permissible alternative, because word-internal |(C)V́(C)| is not allowed in KA.

4.3.2.2. FD-rules which treat voiceless and quiescent *e*

FD-rule IIA as an approach to dealing with the prosodic behavior of syllables with voiceless and quiescent *e* has the effect of rendering such syllables transparent to subsequent applications of FD-rules. What I mean by "transparent" here is that foot definition on the sequence of syllables following the voiceless or quiescent syllable targeted by the rule proceeds as it would if the syllable were absent. A few examples from GAP KA illustrate the point:

niú|ga|taá 'she is talking to him'
niú|ga|tę|kaá = *niú|gat|kaá* 'she is talking about him'
niú|ga|tę|kęg|kií = *niú|gat|kęg|kií* 'she talked about him'

niú|ga|kutár|luní 'being about to talk'
niú|ga|tę|kutár|lukú = *niú|gat|kutár|lukú* 'being about to talk to him'
niú|ga|tę|kęg|kutár|lukú = *niú|gat|kęg|kutár|lukú* 'being about to talk about him'

niú|ga|taqá 'I am talking to him'
niú|ga|tę|kaqá = *niú|gat|kaqá* 'I am talking about him'
niú|ga|tę|kę|ciqá|qa = *niú|gat|kę|ciqá|qa*
or *niú|ga|tęk|ciqá|qa* 'I will talk about him'

niú|gacú|gaqá 'I want to talk to him'
niú|ga|tęksú|gaqá 'I want to talk about him'

If the voiceless syllables to which rule IIA applies were deleted from the above words, the accentuation of the following syllables would remain the same (except in the last example, where the foot boundary must also be deleted). The first group of examples illustrates this fact before a heavy syllable; the second group, before a disyllabic postbase (*–kutar-* 'about to V'); the third group, before the accent-advancing portion of the word ((+*ciqe-*) +*(g)aqa* (future) 1.sg.-3.sg.), and the last pair, before a non-accent-advancing postbase (+*yug-* 'want to V'). The fact that rule IIA predicts the correct results in these varied environments shows it to be a powerful rule. This rule, as given above in 4.3.2.1, appears to be a complete and sufficient statement for all KA outside of Perryville according to my data. However, the rule must be modified somewhat to predict differing forms consistently given by some Perryville speakers. This modification will be discussed below.

We should furthermore note that this rule has the effect of avoiding accented voiceless *e*. This may in fact be the original historical motivation for the rule; certainly accent can not be phonetically detected on voiceless syllables (at least not in Alutiiq). One of the conditions of the KA variant of FD-rule IIIB2 also has the effect of avoiding accented voiceless *e*: accent advancement cannot occur, where the result would be that |XV(C).XV(C).X*e*(C). would be defined as |XV(C)|XV(C).X*é*(C)|. In such cases the accent-advancing rule fails, resulting in |XV(C).XV̇(C)|X*e*(C). Thus these two rules together prevent accentuation on most voiceless syllables.

Not all accented voiceless syllables are avoided by these rules, however, since these are non-initial FD-rules. When an initial or global FD-rule operates in the first cycle of foot definition, an accented voiceless syllable may result, e.g.

kęg|llukú [kᵩx̟ɬu.kú] 'biting it'
qikęr|taq [qí.kᵩx̟.taq] 'island'
agęll|ria [á.xᵩɬ.x̟iá] **or** *agéll|ria* [a.gɔɬ.x̟iá] 'he went' (both forms attested in Perryville)

The fact that some voiceless vowels can be accented renders problematic the generalization that the FD-rules discussed above conspire to avoid accented voiceless syllables. Note also that where a voiceless syllable is accented (e.g. in *qikertaq*), the stress that should accompany accentuation is phonetically manifest on the preceding syllable (see also 2.4, end).[12]

[12] In the process of writing this paper, a number of alternative approaches to the problem of accent in conjunction with obscured (and especially voiceless) *e* have been tried and rejected. An attempt was made to treat all these *e*s as deleted, as in CY. This approach leads to clusters of more than two consonants in cases such as *naa|qis|tę|sináq*, which would become *naa|qist|sináq*. Such clusters might be considered permissible (although unusual for AY) if such treatment simplified the FD-rules. However, voiceless and quiescent *e* cannot be deleted without resyllabification, and this resyllabification would lead in some cases to incorrect foot definition—namely, where the syllable following the voiceless syllable heads an iambic foot. For example, *ming|qe|ciqá|qa* 'I will sew it' would be incorrectly parsed **mingq|ciqaqá*, in con-

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Another problem with FD-rule IIA is that, although this rule is adequate for KA outside of Perryville, in Perryville the rule must be modified to account for differing patterns. The difference appears with the third group of examples above, namely forms like *niu'atekaqa* and *niu'atekeciqa-qa*, where the voiceless syllable targeted by the rule is followed by syllables which belong to the accent-advancing portion of the word. Here two patterns exist in Perryville. Some speakers pronounce these words as elsewhere in KA, whereas other speakers quite consistently use a different pattern, which to my knowledge is unique in KA. The two patterns are exemplified as follows:

niú|'a|te̱|kaqá (some Perry, as elsewhere in KA), *niú|'a|te̱ká|qa* (unique to Perry KA)
niú|'a|te̱|ke̱|ciqá|qa (some Perry, as elsewhere in KA), *niú|'a|te̱|ke̱cí|qaqá* (unique to Perry KA)

The first pronunciation of each word is found in the speech of younger speakers, and is probably the result of influence from GAP KA. One such speaker said that one of his parents was from Mitrofania Village (between Chignik and Perryville, where the small amount of information I have been able to gather indicates that the GAP variety of KA was spoken). The second pronunciation is found with older speakers, a couple of whom were children at the time of the move from Katmai. This appears to represent the original pattern of the Katmai-Asiwak variety (or at least of a subset of people in this area). We will refer to this latter variant simply as the Perry KA variant, leaving it understood that some Perryville speakers do not use this variant.

To account for the Perry KA variants, we must modify FD-rule IIA so that it does not apply where the conditions for subcondition (b) of the KA variant of FD-rule IIC are satisfied, and furthermore we must modify subcondition (b) of rule IIC so that a voiceless syllable to the left of the accent-advancing portion of the word is included in the accent-advancing portion. If we analyze the above examples, we can see how this would work. Taking first the general KA variants, after *niú|* is defined by FD-rule IIIA, we further define

niú|'a|te̱|kaqá: 'a| by IIA; *te|* by IIC(b); *kaqá* by IIIB2.
niú|'a|te̱|ke̱|ciqá|qa: 'a| and *te|* by IIA; *ke|* by IIC(b); *ciqá|* by IIIB2; *qa* by IIA.

Next, taking the specifically Perry KA variants,

niú|'a|te̱ká|qa: 'a| by IIC(b); *teká|* by IIIB2; *qa* by IIA.
niú|'a|te̱|ke̱cí|qaqá: 'a| by IIA; *|te by IIC(b); kecí|* and *qaqá* by IIIB2.

The crucial point here is this: in Perry KA the last (or only) voiceless syllable in question is not defined as an unaccented foot as in general KA; instead it is considered to be part of the accent-advancing portion of the word so that it forms an iambic foot with the following (accent-advancing) syllable.

In the case of subcondition (a) of FD-rule IIC, however, Perry KA does not differ from the rest of KA:

niú|'a|te|kutár|lukú: 'a| and *te|* by IIA; *kutár|* and *lukú|* by IIC(a).

This is due to the overriding consideration that a disyllabic postbase composed of two light syllables must be defined as an iambic foot. Moreover, Perry KA does not differ from general KA in the case

trast with *túk|nin|qe̱|ciqá|qa* 'he will be stronger than I', which would remain essentially the same: *túk|ninq|ciqá|qa*. The approach taken here is to confine *e*-deletion in KA (as in CA) to initial (C)VC*e*. Non-initially, the phonetic loss of *e* is attributed to the surface phonetic phenomenon we call *e*-quiescence and not to the FD-rules.

of voiceless syllables preceding a heavy syllable:

niú|'a|te|kaá: 'a| and *te|* by IIA; *kaá* by IIIA;

nor in the case of a voiceless syllable preceding a non-accent-advancing light syllable:

niú|'a|tęksú|gaá: 'a| by IIA; *teksú|* by IIIB2; *gaá|* by IIIA.

In fact, we see here that the difference in the prosodic behavior of non-accent-advancing syllables and accent-advancing syllables proper to the final accent-advancing portion of the word is neutralized here in Perry KA: *niú|'a|tęká|qa* parallels *niú|'a|tęksú|gaá* in Perry KA, whereas *niú|'a|tę|kaqá* does not parallel *niú|'a|tęksú|gaá* in general KA.

We should also note that the accent-advancing seen in these examples appears to be in some way connected with that seen above (in 4.3.1) with postbases like *-ngnaqe-* 'try to V', as in *niú|'a|tengná|qaá* 'he's trying to talk to her'. In both cases a syllable containing *e* is followed by a non-accent-advancing monosyllabic light postbase. In the case of postbases like *-ngnaqe-*, however, the *e* preceding the postbase is not voiceless or quiescent, so this case must be treated separately. Furthermore, this case accent-advancing is restricted to AP KA, whereas in the former case no dialect variation was found.

In sum, the phenomenon here called accent-advancement provides a tantalizing window through which we can see a type of word-internal syntactic boundary acting as a prosodic delimiter in KA. The view is obscured, however, by the prosodically limited applicability of the rule—any suffix containing a heavy syllable is a priori excluded from consideration—and by the variation found from speaker to speaker, and even with the same speaker. Nevertheless, it seems clear that accent-advancing in the final portion of the word (as discussed in 4.2) follows from a general principle of Eskimo word-internal syntax: following the stem, suffixes range from strictly derivational (these immediately follow the stem and form a new stem) to strictly inflectional (these are always word-final, or more precisely, they precede the enclitic boundary). The intermediate types of suffixes (ad-inflectional, tense-status, and imputative) are unique, and interact with each other and with inflectional endings in unique ways. It is no surprise, then, that this portion of the word is also prosodically unique in KA. It has provided us with a testing ground for what has proved to be the most challenging aspect of this remarkable prosodic system.

EVOLUTION OF PROSODY IN THE YUPIK LANGUAGES

Jeff Leer

1. The prosodic foot

This paper has two goals: to review the evolution of Yupik prosody, and to do so not simply in terms of stress assignment, but by means of rules which divide the word into **prosodic feet**. The foot structure of the word is determined by scanning the word from left to right, and in most Yupik, foot boundaries are determined exclusively by the structure of the syllable(s) following the last assigned foot boundary. When a foot is defined, its surface phonetic form may be modified by the **phonetic adjustment** rules. The most important of these phonetic adjustments in Yupik are stress, vowel lengthening, and consonant gemination. Thus the foot is taken to be the fundamental prosodic unit, and stress assigned to foot structure. Such an approach has been taken in Miyaoka's description of CY prosody and my description of Alutiiq prosody; this approach has been found to have certain organizational advantages over a description based solely on the phonetic processes themselves.[1]

In this paper, as also in my accompanying paper on Alutiiq, the prosodic rules are divided into two types: foot-definition rules (FD rules), and phonetic adjustment rules (PA rules). In addition, the Alaskan Yupik (AY) prosodic systems have other types of rules which do not belong to either of these classes, but which interact with the prosodic rules in such a way that it is best to include them in the discussion. (These are called pre- and post-FD rules in the description of Alutiiq prosody.)

The prosodic rules apply to forms produced by prior application of morphophonemic rules and thus constitute an overlay on the phonemic structure of the word. The operation of the prosodic rules produces the surface phonetic structure. They are applied recursively in cycles. In each cycle, first the FD rules are applied. These delineate a prosodic foot, whose boundary is indicated here by a vertical bar |. Then the PA rule(s) associated with this type of foot are applied. In the first cycle, the FD rules are applied beginning from the word boundary; in succeeding cycles, the rules are applied from the foot boundary produced by the preceding cycle. This process is repeated until interrupted by another word boundary. Thus all prosodic processes are applied in a single pass through the word.

The AY rules are characterized by increasing complexity, beginning from the northernmost AY dialect in the Norton Sound area (NSU) and proceeding southward to Alutiiq and eastward along the coast to Prince William Sound (PWS). In particular, there is a tendency toward specialization of rules. For example, certain rules such as the initial light closed syllable rule are restricted to the first cycle of foot definition. In other cases, we find rules specially designed to deal with what are basically non-prosodic phenomena, such as syllable apocope in CY, and dropping of fricatives and devoicing of *e* in Alutiiq. In this paper, I shall attempt to present a plausible historical explanation of the steps which led from what originally must have been a rather simple system to the complex and ramified rules we find in AY.

[1] The concept of the metrical foot was first suggested for Yupik prosody in Miyaoka (1970:165-167).

Our starting point will be the Central Siberian Yupik (CSY) FD rules, which are the simplest, and which may be virtually unchanged from the original system. Here we have two main rules, which result in two types of foot, the **monosyllabic heavy foot** (abbreviated H|) of the form (C)VV(C)|, and the **iambic foot** (elsewhere called the **rhythmic foot**, abbreviated LS|) of the form (C)V(C).CV(V)(C)|.[2] In Central Yupik (CY) and Koniag Alutiiq (KA), we find two major changes in this system: first, the appearance of a third type of foot, the **monosyllabic light foot** (abbreviated L|) of the form (C)V(C)|; and second, the restriction of the iambic foot to sequences of two light syllables (abbreviated LL|), i.e. (C)V(C).CV(C)|. Chugach Alutiiq (CA) has furthermore developed two varieties of monosyllabic light foot, the **unaccented** variety (abbreviated L|), which corresponds to the original monosyllabic light foot, and the **accented** variety (abbreviated Ĺ|), which results from restructuring of the disyllabic light foot under certain circumstances so that only one syllable remains in the foot. Finally, in Prince William Sound Chugach Alutiiq (PWS CA), there are two varieties of heavy foot, the **accented heavy foot** (abbreviated Ĥ|), and the **unaccented heavy foot)** (abbreviated H|) of the form (C)VV(C)|, which arises in some cases where fricative dropping has taken place between two single vowels, the first of which is not accented.

2. Phonetic adjustments to the foot

Designation of the foot as a prosodic unit is useful insofar as it provides a framework for predicting the occurrence of phonetic phenomena such as stress, length, gemination, and consonant weakening. These **phonetic adjustments** (PA) are thus the concrete manifestations of the abstraction we call the foot. Before discussing the development of the FD rules, we will survey the types of phonetic adjustments which accompany these rules.

2.1. Stress

Stress is perhaps the earliest historical manifestation of foot definition. In CSY and CY all non-word-final feet are stressed, and in Alutiiq word-final feet are also optionally stressed. If the foot is monosyllabic, this syllable is stressed, and if the foot is disyllabic, the second syllable of the foot is stressed. In CA, however, we find a distinction between accented and unaccented feet: accented feet (historically derived from H|, LL|, and word-initial L|) are stressed, and unaccented feet (historically derived from word-internal L|) are unstressed.

2.2. Rhythmic lengthening

One factor in the increasing complexity of AY prosody is a corollary of **iambic stress** (i.e., stress assigned to the second syllable of LL|, an iambic or disyllabic light foot) called **iambic lengthening**. In CSY open stressed syllables of iambic feet, other than those of the form C*e*, are lengthened by a vowel mora. Thus for example, the length of *a(a)* in *qayát|gun* 'by way of kayaks' is short; that in *qayá|kun* 'by way of a kayak' and *qayaát|gun* 'by way of their kayak' is long; and that in *qayaá|kun* 'by way of his kayak' is overlong. Rhythmic lengthening also appears to be operative in Naukanski SY.

In CY, iambic lengthening is confined to light syllables other than those of the form C*e*; the iambic FD rule itself is confined to sequences of two light syllables, so iambic stress occurs only on light syllables. The distinction between *qayakun* and *qayaakun* is maintained not by vowel length but by defining the light syllable before the heavy syllable as a monosyllabic foot: *qáy|:aá|kun* (where : (colon) represents the geminate of the preceding consonant). This is discussed further below.

In Alutiiq, an important restructuring has occurred due to shortening of closed and final heavy

[2] The following abbreviations for syllable types are used here: L = light syllable, i.e. (C)V(C).; H = heavy syllable, i.e. (C)VV(C).; S = light or heavy syllable, i.e. (C)(V)V(C). Other symbols used here are | (foot division), **ENVIR** (instead of a slash, for "in the environment"), *e* (for [ɨ]), ɣ and χ (for the uvular fricatives), in phonetic transcription.

syllables (similar shortening of heavy syllables is also found in Nunivak and Hooper Bay-Chevak CY). This process is called **compression** of the heavy syllable. As a result, both the heavy syllable and the final syllable of an iambic foot (unless of the form C*e*) are long in open non-final position, and short elsewhere. In CA, the syllable comprising an accented monosyllabic light foot (Ĺ|) behaves in the same way. These three types of foot, which follow the same PA rule with regard to lengthening of vowels, are thus grouped together under the name of **accented feet**.[1] Accented feet furthermore undergo a form of strengthening of the initial consonant of the foot called **fortition** (see below). Moreover, as we have seen above, in CA only accented feet are stressed. Unaccented feet, on the other hand, undergo neither lengthening nor fortition, and are unstressed in CA (but stressed in KA). Thus the accented type of foot is multiply distinguished from the unaccented type in Alutiiq by associated phonetic adjustments to the foot, both foot-finally and foot-initially.

2.3. Gemination

Consonant gemination in Yupik is not structurally or historically comparable to that found in Inupiaq. It is lacking in CSY and apparently also in Naukanski SY. In AY, gemination has various sources: lexical, morphophonemic, and prosodic. Prosodic gemination arises in two cases—in stressed syllables of iambic feet having the form C*e*, and in open monosyllabic light feet preceding heavy feet. Gemination with iambically stressed C*e*, which could be called **iambic gemination**, regularly occurs in CY (provided, of course, that *e* has not been deleted by an earlier rule). In Alutiiq, such gemination is confined to stressed C*e* with voiced *e*. This type of gemination is a form of syllable strengthening which is in complementary distribution with iambic lengthening (which operates on syllables of the form (C)V, where V is not *e*). These two processes, iambic lengthening and iambic gemination, are thus complementary means of "strengthening" the foot. Both forms of strengthening result in phonetic doubling of a segment: with prime vowels (*a, i, u*), the syllable vowel is doubled (lengthened), whereas with *e*, which cannot be lengthened, the following consonant is doubled (geminated) instead; compare CY *nunáka* [nu.ná:.ka] 'my land, town' and *tumémˇa* [tu.mə́m.:a] 'of my footprint'. (Note that the foot boundary is placed between the geminated consonant and the following vowel. The reader should keep in mind that this syllable begins with a copy of the geminated consonant.)

Closure of an open monosyllabic light foot with the geminate of the initial consonant of a following heavy foot, as seen in the discussion of iambic lengthening, serves in CY to distinguish vowel length due to iambic lengthening from the innate length of long vowels where these would otherwise be confused. Thus, whereas the second syllable of *qáy|aá|kun* is identical with that of *qavá|kun*, the distinction is maintained by definition of *qa* in the first case as a monosyllabic light foot (L|); this is phonetically manifested as stress and gemination of the *y*. Jacobson calls this **automatic gemination**; here we call it **L|-gemination**. In CY, L|-gemination results in the fact that all L| are phonetically closed.

In Alutiiq, we find a degemination rule which neutralizes gemination after an unaccented vowel. Since monosyllabic light foot is accented word-initially but not word-internally before a heavy syllable, gemination before a heavy syllable is retained only in initial syllables. Elsewhere, gemination is not necessary to maintain the contrast between (C)V.CV(C)| and (C)V|CVV(C)|, since in the second case the heavy syllable, being defined as a heavy (accented) foot, begins with a fortis consonant.

[1] Note that the term **accent** as used here is not equivalent to **stress**. Stress is a phonetic attribute of the syllable, whereas accent is a prosodic marking which predicts vowel lengthening. Since the same rule for vowel lengthening also applies to heavy syllables in Alutiiq, the term "iambic lengthening" is inappropriate in Alutiiq; "accentual lengthening" would be a better description.

2.4. Consonant strength

In AY we find diverse phenomena involving consonant strength. Fricatives may be weakened or deleted, have tense and lax allophones, or be devoiced. In Alutiiq, accented-foot-initial consonants undergo fortition. These phenomena are heterogeneous, and in some cases are unrelated or only marginally related to prosody.

To the north and south of GCY we find a tendency for consonants to weaken or drop at the boundary between the two syllables of a disyllabic light foot. This is seen most dramatically in Bering Strait Inupiaq, where lenition of iambic foot-internal consonants and consonant clusters is the only phonetic manifestation of foot definition. A similar phenomenon is found in the neighboring NSU dialect of CY, where light-syllable-initial voiced fricatives following closed syllables have two allophones: a tense variant that has the same degree of approximation and friction as a voiceless fricative at foot boundary, and a lax sonorant-like variant found foot-internally (i.e. in the second syllable of an iambic foot). In Alutiiq there are also lexical traces of dropping of syllable-final *r* and *g* in this position, such as *kég|tuyáq* (PWS CA *kegtu'aq*) found in some places for *kég|turyáq* 'mosquito', and *iwál|rayák* (AP KA) and *yual|'ayák* (CA) 'crab' for **iwalraryak*, and in KA also in certain disyllabic postbases which typically form an iambic foot, such as *+yatur-* for *+yartur-* 'to go in order to V' and *+cunite-* for *+cugnite-* 'to smell like N'.[4]

The development of tense vs. lax allophones of voiced fricatives has apparently also led to devoicing of fricatives (originally of the tense, more approximate variety) in Nunivak CY and KA, and dropping of voiced fricatives (originally of the lax, more sonorant-like variety) in KA and CA. Here, however, we find a completely different distribution pattern from that seen above with NSU. Devoicing of fricatives (in Nunivak, Perryville, and Afognak—all voiced fricatives; in the rest of KA, only *g* and *r*) occurs where the voiced fricative is geminated in Nunivak CY and KA, and in KA also at the head of a heavy foot and syllable-finally. Dropping of fricatives which head a light syllable is a characteristic phenomenon of all Alutiiq, but has become more highly developed and affects the prosodic rules in CA, particularly in PWS CA.

A partially related phenomenon, characteristic of all Alutiiq, is called **fortition**. As discussed under iambic lengthening, the accented foot is characterized not only by strengthening of open accented non-final syllables, but also by fortition of the initial consonant of the foot. For a detailed description of the phonetic nature of fortition we refer the reader to 1.3.1 of "Prosody in Alutiiq" in this volume. Two major points bear repeating here. First, fortition is properly a function of the syllable boundary which precedes the accented foot; the continuity of air flow is interrupted so that the onset of an accented foot resembles word onset. This resemblance is reinforced by the fact that word-initial feet are always accented, so that a word-initial consonant is automatically fortis. Second, whereas fortis voiceless consonants are fully voiceless, lenis voiceless consonants following a voiced segment are partially voiced, e.g. Alutiiq *taú|kut* (with semi-voiced *k*) 'those', *taú|kuní* (with fully voiceless *k* preceded by interruption of breath flow) 'in those'.[5]

Thus two distinct varieties of "consonant strengthening" are found in KA, devoicing of fricatives and fortition. Although these phenomena are not comparable in most respects, in both cases there tends to be an inverse relationship between strengthening and voicing.

[4] Documentation of this no longer productive phenomenon will not be attempted here. For the behavior of disyllabic postbases in KA, see section 4.2 of "Prosody in Alutiiq," this volume.

[5] In most modern Koniag KA, distinctive fortition has been observed at the head of the heavy foot but not at the head of the iambic foot. Data from Tyzhnov's religious translations, however, imply that fortition was present in both cases (although perhaps less prominent at the head of the iambic foot). For a fuller discussion of this point, see section 1.3.1 of "Prosody in Alutiiq," this volume.

3. Evolution of the FD rules

The Yupik prosodic systems increase in complexity proceeding from Siberia through the Norton Sound area to the southwest portion of mainland Alaska and the Pacific Gulf. The simplest prosodic systems to the north, CSY, BS Inupiaq, and NSU CY, show a natural progression which may coincide fairly closely with the historical evolution of the AY prosodic system.[6] From NSU CY, the transition to GCY is smooth, but the Alutiiq prosodic system departs radically from NSU CY and GCY. The earliest prosodic developments in Alutiiq, compression and lax/tense allomorphy of voiced fricatives, also occur in peripheral CY dialects (Nunivak and/or Hooper Bay-Chevak (HBC)). This may indicate an early southerly dialect grouping from which Alutiiq separated.

In this paper, therefore, we attempt to indicate summarily the kinds of systematic changes which could have accrued and interacted in the development of the Yupik prosodic systems. The prosodic system of CSY will be taken to represent the first stage of development, that of BS Inupiaq the second stage, that of NSU CY (Norton Sound-Unalakleet) the third stage, which has developed to include the prosodic rules common to all Alaskan Yupik. Subsequently, AY south of NSU is differentiated into CY (Central Yupik) and Alutiiq, and KA and CA diverge within Alutiiq.

In the first stage (CSY) we find the heavy syllable FD and iambic FD rules. In the second stage (BS Inupiaq) there appears one additional rule, which defines an initial light closed syllable as a monosyllabic light foot. In the third stage (NSU CY), the iambic FD rule is modified so that it applies only to a pair of light syllables, and another rule defines a light syllable as a monosyllabic light foot before a heavy syllable (in the previous two stages the iambic FD rule applies to such a sequence of light plus heavy syllables).

The third stage (NSU CY) is the common foundation for the Alaskan Yupik prosodic systems. CY and Alutiiq have both modified this foundation by adding rules which define a light syllable as a monosyllabic light foot before a light syllable, but we are not certain there is a direct genetic connection between the CY and the Alutiiq variants of this rule. The phenomenon of *e*-deletion also occurs in both CY and Alutiiq, but in Alutiiq it is restricted to the first prosodic foot in the word. Moreover, in Alutiiq the rule defining a monosyllabic light foot before a heavy syllable has a special variant which applies to the first prosodic foot in the word. Finally, in Alutiiq it is useful to make a distinction between accented and unaccented feet. Monosyllabic light feet (and in PWS CA also heavy feet) occur in accented and unaccented varieties, and in CA there arise special rules which make this dichotomy a fundamental feature of the prosodic system.

4. CSY: Heavy syllable FD and iambic FD

The two major FD rules of CSY are found in some form in all Yupik and appear to represent a very early stage in the development of Yupik prosody. Naukanski and BS Inupiaq also share these rules in the same form. In addition, BS Inupiaq has the initial light closed syllable FD rule, and in Naukanski we seem to find cases where light closed syllables are defined as monosyllabic feet, although the available data do not allow us to draw definite conclusions.

> **Heavy syllable (H|) FD:** *A heavy syllable is defined as a foot. PA: stress.*
>
> **Rhythmic (LS|) FD (SY):** *A light syllable plus the following syllable (light or heavy) together form a iambic foot. PA: stress and iambic lengthening on the second syllable (if open).*

[6] The evolutionary status of the Sirenikski and Naukanski SY prosodic systems cannot be conclusively determined until these systems are better understood. These two languages are therefore largely ignored in this comparative overview, and the reader is referred to Krauss's treatment of them in this volume.

Both these rules result in the formation of a foot terminated by a stressed syllable, except word-finally, where neither stress nor iambic lengthening applies. Note that in this system, a heavy syllable may be stressed by either rule, but a light syllable can be stressed only by the iambic FD rule.

One minor case is not covered by the above rules—namely, a word-final light syllable. In order to reach word boundary and formally terminate the foot definition process, we must define such a syllable as a foot, as in *iqá|lluk* (fish), for example. In a description of CSY prosody based on stress assignment, it is not necessary to observe this nicety

At the time when Sirenik, Yupik and Inupiaq were diverging from Proto-Eskimo, there had evidently been a wave of phonologically and/or morphologically conditioned lenition in PE whereby, for example, intervocalic suffix-initial **p* and **t* were spirantized to **v* and **z̨*. These suffixes thus came to have two allomorphs, e.g. the intransitive indicative ending formant **tu-* (following a consonant) alternating with **z̨u-* (following a vowel). In Inupiaq this process was extended to intervocalic suffix-initial **k* and **q*, which spirantized to γ and γ̨, cf. Yupik *nuna-ka*, Inupiaq *nuna-ga* 'my land' (see Kaplan 1981a.171-184). The voiced fricatives **γ*, **γ̨*, and **z̨* were also in the process of leniting and dropping between single vowels in all Eskimo except possibly in Sirenikski, with conditions varying from language to language.

The interesting question here is this: when a voiced fricative had dropped between single vowels, was the sequence (C)VV(C) considered disyllabic, i.e. (C)V.V(C)., or monosyllabic (i.e. a heavy syllable) at the time of the origin of the Yupik prosody rules? In other words, did the origin of Yupik prosody coincide with the evolution of the heavy syllable type? Although the answer to this question is not evident, it seems clear that there is an evolutionary pattern here: lenition leads to fricative dropping between vowels, which leads to the creation of a new syllable type, the heavy syllable (C)VV(C).[7]

5. AY and BS Inupiaq: Initial light closed syllable FD

The following FD rule (which will be abbreviated #L| FD) is found in all AY and BS Inupiaq.

> **Initial light closed syllable (#L|) FD:** *An initial light closed syllable is defined as a foot. PA: stress.*

The origin of this rule is one of the more interesting questions of prosodic evolution. The rule is totally absent in CSY (the only Siberian Yupik for which we have definitive data), but present everywhere in AY. One would like to see evidence of a transitional stage in Naukanski, but the evidence here is obscured by the existence of (apparently genuine) prosodic alternants. Krauss argues persuasively (see "Sirenikski and Naukanski," this volume, sections 3.2-3.4) that Naukanski lacks the #4 rule as such, and that the examples we have of initial light closed syllable stress are due to a tendency to stress light closed syllables. Nevertheless, since the available data do not allow us to formulate definitive rules for this phenomenon, we cannot say with certainty that the #4 rule is (and always was) lacking in all Siberian Yupik.

Siberian Yupik does, however, have a process which Jacobson calls **initial syllable lengthening**, whose motivation is to keep the stress on the stem of the word. With stems of the form (C)VCə(C)-, where V is a "prime vowel" (i.e. not ə), the stem vowel is lengthened where ə is deleted

[7] It is precisely on this point that Miyaoka's description of Yupik prosody diverges from that of this article and Jacobson's article. Miyaoka treats sequences of the shape (C)VV(C) as prosodically disyllabic, i.e. (C)V.V(C), thus obviating the distinction between light and heavy syllables. From this point of view, what we call heavy syllables are to be considered iambic feet, i.e. (C)V.V́(C)|. Thus, Miyaoka accounts for the innovation due to fricative dropping by introducing a rule which avoids the sequence (C)V́.V(C)., rather than attributing this to the evolution of a new foot type, the heavy foot.

by a morphophonemic rule, so that stress falls on the stem by the heavy syllable FD rule, rather than on the following suffix by the iambic FD rule.* As Jacobson further points out, however, it is a mistake to draw the conclusion that initial syllable lengthening has occured in CSY where and only where an ə has been deleted. For example, with CSY *aatgha*, NSU CY *atra*, Inupiaq *atqa* 'his name' and CSY *maalghuk*, NSY CY *malruk*, Inupiaq *malɣuk* 'two', Proto-Eskimo presumably lacked a ə between the two consonants; whereas with CSY *atkuk*, Naukanski and NSU CY *atekuk*, Inupiaq *atigi* 'parka', Proto-Eskimo *ə has apparently been dropped in CSY without compensatory initial syllable lengthening. Thus, although the synchronic operation of this rule is rather clearly defined, its historical evolution remains obscure.

We see, then, that initial syllable lengthening in CSY is synchronically a morphologically motivated process, in contrast with the phonologically motivated #L| FD rule of AY and BS Inupiaq. It is difficult to envision an evolutionary sequence of events whereby one of these processes could directly have given rise to the other. More likely, #L| FD at first arose in certain cases by a limited phonological and/or morphological rule, and later became generalized to all initial light closed syllables in AY, but was reinterpreted as a device to keep stress on the stem in CSY.

Before suggesting a hypothesis for the evolution of this rule, we should note that this is the first FD rule where syllable closure is a factor in the conditioning of the rule. We will see that syllable closure is also a conditioning factor in a later FD rule specific to GCY— closed light syllable FD before an open light syllable. Such a rule is conspicuously absent, however, in NSU CY and Alutiiq.

The fact that a closed light syllable is defined as a stressed foot by the #L| FD rule would seem to be a phonologically "natural" development, since CVC. is inherently "stronger" than CV., just as a heavy syllable is inherently "stronger" than a light syllable.† It is possible to argue that this rule simply reflects a broadening of the criterion for syllable strength that must be satisfied in order to define the syllable as a stressed foot, so that a closed syllable is also included as a "strong" foot type. The "strong" foot types (heavy syllable, light closed syllable) are defined as a foot word-initially, but the weakest possible foot type (light open) is not.

Such an explanation leaves much to be desired, however. Why is the #L| FD rule restricted to initial syllables? If the rule simply reflects extension of syllable strength to include closed syllables, we would expect the non-initial closed syllable also to be defined as a foot. Furthermore, the comparable CSY initial syllable lengthening rule is also restricted to the initial syllable, and is synchronically linked with the CSY ə-deletion rule. We therefore seek a hypothesis for the evolution of this rule that can explain why the AY #L| FD rule and the CSY initial syllable lengthening rule operate only word-initially and how the CSY rule is historically related to ə-deletion.

We will seek the origin of this rule in a morphophonemically motivated process we call ə-deletion. This process is also found in Inupiaq, where it is largely lexically marked. This process (called syncope of *ï*, where *ï* is a morphophoneme reflecting *ə) has recently been described in Kaplan 1981a.133-148 and 1981b.87-8. In Inupiaq, syncope of *ï* is typically found with stems of the shape (C)VCïi(C)-, which become (C)VC(C)- before certain suffixes, although it is also found with longer stems. Like lenition of consonants, ə-deletion probably originated in Proto-Eskimo before the Yupik-Inupiaq split. ə-deletion has developed in different ways in Inupiaq, Yupik and Sirenikski, but there are some cases where ə-deletion is found in all Eskimo, e.g. where suffixes beginning with a vowel are added to stems ending with *VCəC-; hence with *atəγ-a > *$at\gamma a$ 'his name':

* In this section I have chosen to use the symbol ə to refer to the fourth vowel, but have not changed its representation in the various practical orthographies.

† This fact has long been recognized in Eskimo linguistics; see Krauss's article in this volume, where he quotes Kleinschmidt's observation of this phenomenon in Greenlandic.

Inupiaq *atqa*
Sirenik *atχa*
CSY *aát|gha*
AY *át|ra*

The Proto-Yupik ə-deletion rule is morphophonemically motivated and (at least word-initially) is accompanied by phonetic stress on the resulting closed light foot. The rule given below roughly describes the process. Case (a) is illustrated by the above example; case (b) is discussed below:

> **ə-deletion (PY):** *(C)V.Cə. → *(C)V́C| /__CV..., *where (a)* C *is the stem-final consonant and* V... *is a suffix, or where (b)* CV... *is an adding-type suffix with a voiced initial consonant. PA: stress (at least on an initial syllable); devoicing of the suffix-initial consonant after a voiceless stem-final consonant.*

Adding-type suffixes are those which do not require the dropping of stem-final consonants, i.e. **k* (**γ*) and **q* (**χ*). It can be demonstrated that ə-deletion did not occur in PY with dropping-type suffixes (those which require the dropping of the stem-final consonant), such as the third person reflexive possessive suffix **-ni*,[10] where ə-deletion did not occur with e.g. the stem **tumə* 'track, footprint':

Inupiaq *tumïni* 'his own tracks'
CSY *tumén|i*
NSU CY *tumén|i*
GCY, Alutiiq *túm|ni*

The subsequent evolution of a second ə-deletion rule in GCY and Alutiiq results in *túm|ni* in these languages.

With these forms we can compare those obtained with the adding-type locative plural case ending * + *ni*. Here PY **tumə́ni* → **túm|ni* according to the above rule.

Inupiaq *tumïni* 'in the tracks'
CSY *tuúm|ni*
all AY *túm|ni*

In GCY, the distinction between these two forms is neutralized by the operation of the second ə-deletion rule.

With verbs, the subordinative ending formant * + *lu-* can be used to illustrate ə-deletion. When the third person intransitive ending * + *luni* is added to stems **aŋə-* 'to be big' and **takə-* 'to be long', we again find PY **aŋə́luni* → **áŋ|luni* and **takə́luni* → **ták|luni* (with devoicing of **l*):

Inupiaq *aŋïluni* 'it being big'; *takïluni* 'it being tall'
CSY *aáng|luni; taák|luni*
AY *áng|luni; ták|luni*

[10] The fact that *-ni* (3. refl. sing. possessor) is a minus-type suffix may be explained by assuming that this suffix began with a consonant cluster in Pre-Proto-Eskimo. There is, however, no evidence that such clusters persisted into Proto-Yupik; hence failure of *e*-deletion must be considered morphologically (not phonetically) motivated at this stage.

In all Yupik, but not in Sireniksk, *l* is devoiced following *k*.[11] The behavior of the ending formant * + *lu-* contrasts sharply with that of the lexically restricted postbase * + *li-* 'come to V', which causes loss of final *ə in both Inupiaq and Yupik.

Inupiaq *aglil'uni* 'it becoming big'; *taklil'uni* 'it becoming long'
CSY *anglí|luni; taklí|luni*
AY *áng|lilú|ni; ták|lilú|ni*

Here the Inupiaq and CSY forms indicate that if ə-deletion occurred with this suffix, it had probably already taken place before the separation of Inupiaq and Yupik. Hence the ə-deletion rule did not apply in PY, and these forms are to be prosodically reconstructed as PY **aŋlí|luni* and **takli|luni*.

Note also that ə-deletion occurs in non-initial position in all Yupik, e.g. **aqumə|luni* → **aqúm|luni* 'he sitting'. In this case, however, the deleted ə is not due for iambic stress, and when it is deleted, *aqum* is defined as an iambic foot, so that stress on *qum* is not attributed to the ə-deletion rule. In the case of a stem like CSY *saguyange-*, AY *cauyange-* 'to get a drum', we find

CSY *sagú|yanglú|ni*
NSU CY *caú|yanglú|ni*

Here we would expect PY **caɣú|yaŋə́|luni* → **caɣú|yáŋ|luni* if the PY ə-deletion rule had produced irregular stress word-internally as well as word-initially. This result is found neither in CSY nor NSU CY.[12] Thus we may speculate that the ə-deletion rule quickly evolved into a rule which deleted any stem-final ə before the specified suffix type, and assigned irregular stress only in the case where a closed initial syllable resulted:

Modified ə-deletion (PY): *(C)V.Cə. → *(C)V́C| / #__CV...,
*(C)VC| /...__CV..., (etc.)

In short, it seems most likely that irregular stress was soon confined to cases where the ə-deletion rule produced a monosyllabic light stem, this stress serving to impart markedness to the stem, as is still the initial closed syllable lengthening rule in CSY.

[11] Comparison of the following forms (stems *anə-* and *taqə-*) reveal a complex picture that may have been influenced by CSY (citations from Menovshchikov's Sireniksk grammar, 1964):

anləma 'I going out' (p. 179)
ánləmi 'he going out' (p. 112:56, p. 116:25)
taqəlki 'he finishing them' (p. 112:57)
táqəlmən 'they finishing' (p. 118:5)
taqcəɣ 'finished (p. 197)
taqəsqəɣtəɣə 'finished something' (p. 197)

These forms suggest that stem-final ə was originally retained, but later, in a sequence of two Cə syllables, one of the əs was lost:

anələma → anləma* **but
**taqələmən → taqəlmən*
taqəcəx → taqcəx* **but
**taqəcəqəɣtəɣə → *taqəcqəɣtəɣə → taqəsqəɣtəɣə*

Sireniksk *-lə-* here is equivalent to the *-lu-* of *-luni*, and Sireniksk *-cəɣ* ← **-zu-q* (2. sing. *-cə-tən* ← **-zu-tən*) equivalent to the ending discussed below.

[12] The form *cau|yang|luni* is found in GCY from the operation of the later CVC|CV rule; see the end of section 7.

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Likewise, ə-deletion occurs before the intransitive indicative ending formant *+*tu-*, which by PE lenition becomes *+*ẓu-* following a vowel; hence the third person singular forms **aŋəẓuq* → **áŋ|ẓuq* and **takəẓuq* → **ták|ṣuq* in PY.[13] During the PY period, however, another phonological development also took place: **ẓ* and **ṣ* were lost as distinctive phonemes in Yupik. Following a syllable-final consonant, **ẓ*, **ṣ* > Ø in Yupik, and resyllabification occurs in order to prevent a word-internal vowel-initial syllable: *VC.ØV > *V.CV; e.g. PE **uɣẓuq* > PY **u.ɣuq* 'moss', and PE **uq.ṣuq* > PY **u.quq* 'oil'.

Where *e*-deletion occured in conjunction with the dropping of **ẓ*, **ṣ*, it appears that historically the former preceded the latter; hence PY **aŋəẓuq* → **áŋ|ẓuq* > **á|ŋuq* and **takəẓuq* → **ták|ṣuq* > **tá|kuq*. The modern forms are

Inupiaq *aŋïẓuq* 'it is big'; *takïẓuq* 'it is long'
CSY *aá|nguq; taá|kuq*
AY *ang|'uq* [áŋ.:uq]; *tak|'uq* [ták.:uq]

It is possible that phonetic gemination accompanied such initial stressed open light feet in PY, as it does in AY. Alternatively, this gemination may have arisen in AY at the same time as the parallel closure by gemination of a light open syllable defined as L| before a heavy syllable, i.e. CVCVV → CV́C|:V̀V.[14]

If loss of **ẓ*, **ṣ* as distinctive phonemes had historically preceded the ə-deletion rule in PY, however, we would rather expect PY *əẓV > *VV, as occurs elsewhere in Yupik:

Inupiaq *qiẓuk* 'wood'
Sirenik *qɔcəx*, (*sic*, for *qɔcəx*), suffixed *qərɯɣ-*
CSY *quuk*
AY *quuk, equk*

If this historical ordering were correct, we would expect PY **aŋəẓuq* > **aŋuuq*, which is not attested anywhere in Yupik. We thus conclude that the correct historical order of events is first PY ə-deletion, then loss of **ẓ*, **ṣ*. This correctly predicts loss of stem-final ə before an adding-type suffix in Yupik, as well as predicting initial syllable lengthening in CSY gemination in AY.

If the phonological development described above is valid (even if incompletely described), then it culminated in a rule which produced stressed #L| FD in a limited morphologically defined environment, and resulted in the creation of a new type of foot, the (stressed) monosyllabic light foot (L|). Outside of this special case, initial light syllables formed a iambic foot with the following syllable. We might expect that the irregularity introduced by the special case of #L| FD would have a destabilizing effect on the prosodic system, and that #L| FD would spread to other morphological and/or prosodic environments, until some kind of regularity was reestablished.

[13] Compare also BS Inupiaq *ɣiẓuq* and *iksuq*, both from *iki-ẓuq* 'it is burning'; see Kaplan 1981b p. 87.

[14] Another case where such gemination occurs in AY is with the non-absolutive singular demonstrative noun suffix *+*tu-*, which by lenition becomes *+*ẓu-* following a vowel. In this case, however, Inupiaq and Yupik show different reflexes of the demonstrative base preceding this suffix. For example, the demonstrative base *uɣ-* 'toward exit (restricted)' appears in Inupiaq as /uɣ-/ but in Yupik as **uɣə-*. Hence the non-absolutive singular stem appears as Alaskan Inupiaq *uk-tu-* but PY **uɣə-ẓu-* → **úɣ|ẓu-* → AY *ug'u-*. This parallels also the absolutive singular with suffix *+*na*. Inupiaq *ug-na* but PY **uge-na* → *úg|na*.

Inupiaq *uɣna; uktu-*
Sirenik *uɣna; uŋcə-*
CSY *uúg|na; ugu/-*
AY *úg|na; úg|'u-* [úɣ.:u...]

Here, although Sirenik and AY show the expected reflexes of **uɣə-ẓu-*, the CSY form *ugu-* in place of the expected **uuqu-* is anomalous.

6. Alaskan Yupik: Restriction of iambic FD

At the time Alaskan Yupik diverged from Siberian Yupik, iambic lengthening must have been operative, but the extent and nature of this lengthening is open to question. Perhaps, as appears to be the case in Naukanski, lengthened single vowels in the stressed syllables of iambic feet were at first only half-lengthened, so that they were not as long as double vowels. If we chart the relationships between syllable weight and phonetic vowel length (number of morae) by language in the following order, we see a succession which may well be similar to the historical evolution of iambic lengthening.

Chart 1. Phonetic vowel length in Alaskan Eskimo languages[15]

	1.0	1.5	2.0	2.5
Inupiaq	V		VV	
Naukanski[16]	V̄	V̄, VV̄	VV̄	
CSY	V̄		V̄, VV̄	VV̄
NSU CY, GCY	V̄		V̄, VV̄	
HBC, Nun. CY; Alutiiq	V̄, VV̄		V̄, VV̄	

We see from this chart that in AY an important phonetic simplification has taken place: in contrast to the three-length systems found in SY, there are only two phonetic syllable lengths, as in Inupiaq. There are two ways of looking at this simplification. It can be considered a phonetic merger of the lengthened and unlengthened open heavy syllable. This phonetic merger thus anticipates the further shortening or **compression** of (C)VV(C), in HBC, Nunivak CY and Alutiiq, whereby phonetic vowel length is no longer directly correlatable with syllable weight. This is further discussed in section 8.

Alternatively, we may attribute the neutralization of phonetic vowel length in CY to a restriction of the iambic FD rule so that it applies only to sequences of two light syllables. This rule may thus be referred to as the LL| FD rule.

> **LL| FD (AY):** *A sequence of two light syllables is defined as a foot. PA: stress and iambic length/gemination on the final syllable.*

Thus heavy syllables, being excluded from this rule, are not subject to iambic lengthening.

Since a sequence of light syllable plus heavy syllable is no longer covered by the iambic FD rule, a separate rule is necessary to handle this circumstance. This rule (abbreviated the L|H| FD rule) also covers the case of a word-final light syllable, which is not defined as a foot by any rule so far.

> **L|H| FD (AY):** *A light syllable preceding a heavy syllable or word boundary is defined as a foot. PA: L|-gemination with an open syllable followed by a heavy syllable.*

Examples of these two rules are

qayá|kun 'by way of a kayak'
qáy|aá|kun 'by way of his kayak' (phonetically [qáy|:á:|kun])
áng|yakun 'by way of an open skin boat'
áng|yaá|kun 'by way of his open skin boat'

[15] In this chart, the column numbers represent approximate morae of phonetic vowel length. (V)V̄ represents a non-lengthened vowel or vowel pair, and (V)V̄ a lengthened vowel or vowel pair.

[16] The Naukanski vowel lengths are not fully understood, but the phonetic vowel lengths given here have been observed in the sample of recorded text to which we have access.

In Alutiiq, the PA is further restricted so that gemination occurs only with an initial syllable; in fact, it has been found more convenient to divide this into two rules: an initial rule (with resultant closure by gemination of an open syllable resulting in an #L| in all cases), and a non-initial rule (without L|-gemination, and in CA also without stress). This bifurcation of the rule is further discussed in section 9.

By this restructuring in AY, phonetic simplification of vowel length has taken place at the expense of greater abstraction in the phonetic realization of the underlying syllable structure. Since syllables with two vowels are not necessarily phonetically longer than those with a single vowel in AY, in this paper we refer to the number of vowels in a syllable as syllable weight (heavy and light) rather than as syllable length.

At this stage (NSU CY), monosyllabic light feet have two sources: the #L| FD rule, and the L|H| rule. Furthermore, the L|H| FD rule is the first which requires forward scanning, i.e. inspection of the following syllable (which is not included in the foot) to see if it is heavy or if word boundary is encountered, in which case the rule will apply. By this deceptively simple modification of the iambic FD rule, the basis has been laid for the type of rule to be discussed in the following section, namely, light syllable FD before a light syllable, which likewise creates a monosyllabic light foot and requires forward scanning. The rules presented up to this time describe the stage of prosodic development seen in NSU CY. In the rest of Alaskan Yupik, we find some form of FD rule which defines a light syllable as L| before another light syllable, as well as an *e*-deletion rule.

7. CY: E-deletion and further light syllable FD

I earlier developed the hypothesis that #L| FD in AY arose from an earlier stage, before SY and AY had diverged, where stressed initial light closed syllables were created and defined as #L| by a limited morphologically motivated ə-deletion rule. This resulted in a mixed prosodic system, where FD was partially phonologically assigned (i.e. based on syllable structure alone), and partly morphologically assigned. By generalizing #L| FD, AY returned to a system where the foot is defined solely by phonological rules operating on the surface syllable structure.

In this section I argue that the same type of evolution was repeated later in AY because of a second rule of ə-deletion (henceforth called *e*-deletion) restricted to AY minus NSU CY.

E-deletion (CY): (C)V.Ce. → (C)VC|. *PA: stress.*

In most CY this rule is blocked where the *e* separates two identical consonants, in which case the sequence is defined as an iambic foot with iambic gemination following the *e*. It should thus be ordered before the iambic FD rule.

In Alutiiq there is a variant of the *e*-deletion rule which applies only word-initially. This rule may also be linked to a surface phonetic process called **e-quiescence**, whereby non-initial (C)V.Cé| alternates with (C)VC|, or the two are indistinguishable in KA. For details see section 10.

The first set of examples illustrates the operation of the CY rule, and the second set illustrates forms which would result from the rules given so far where there is no *e* to be deleted.[17]

[17] These forms appear to represent the stage of prosodic evolution found in NSK (Kotlik) CY, although available evidence for this dialect is not sufficient to verify all these forms (which must thus be regarded as representing a hypothetical intermediate stage of prosodic evolution). Note, however, that the word *qanrutekeqatallequ* → *qan|rut|keqa|talqa*, 'what I was going to talk about' attested in a recording of free speech by NSK speaker Agnes Hooch (personal communication, Steven Jacobson) agrees with the form *qan|rut|kaqa* given below.

ateqa → *át|qa* 'my name'
qanrutekaa → *qán|rút|kaa* 'he's talking about her'
qanrutekaqa → *qán|rút|kaqa* 'I'm talking about her'
qanrutekanka → *qán|rút|kanka* 'I'm talking about them'

atra → *át|ra* 'his name'
qanresqaa → *qán|rés|qaa* 'he told her to talk'
qanresqaqa → *qán|resqá|qa* 'I told her to talk'
qanresqanka → *qán|resqán|ka* 'I told them to talk'

Note that in the first two examples of each set, the resulting foot configurations coincide, but for different reasons. The first syllable of *atra* is subject to #L| FD, and *res* of *qanresqaa* is defined as a foot by L|H| FD. Where a light syllable follows a non-initial closed light syllable, however, the result of *e*-deletion diverges from that found where *e* was not deleted. The *e*-deletion rule thus results in a prosodic system where foot definition cannot be predicted from the surface phonemic syllable structure, as did the morphologically motivated *e*-deletion rule which we have supposed to be the precursor to #L| FD at an earlier period.

One way of adjusting the prosodic system so that foot definition can be predicted from the surface syllable structure would be simply to create a new FD rule which defines any closed light syllable as a foot, so that both underlying (C)VC and underlying (C)VCe would result in a monosyllabic light foot (C)V́C| in any position.

> **Closed light syllable FD (CY):** *A closed light syllable is defined as a foot. PA: stress.*

In the resulting system, then, FD where *e*-deletion has occurred is identical with that where *e* was not present in the first place. The examples given above would thus have the following foot configurations.

át|qa, át|ra
qán|rút|kaa, qán|rés|qaa
qán|rút|kaqa, qán|rés|qaqa
**qán|rút|kán|ka, *qán|rés|qán|ka*

This is only a short step removed from the actual forms found in CY minus NS. One final adjustment is necessary.

> **Redefinition of a pair of closed monosyllabic light feet:** *A pair of closed monosyllabic light feet is redefined as an iambic foot, unless the first foot of the pair is word-initial. PA: removal of stress from the first syllable.*

By this rule, *qán|rút|kán|ka* and *qán|rés|qán|ka* are redefined as *qán|rutkán|ka* and *qán|resqán|ka*—precisely the result we find in CY minus NS, according to Jacobson.[18] The motivation for this rule would seem to be that sequences of closed light syllables which would be defined as monosyllabic light feet could be quite long, e.g. *nér|ciq|súg|nár|qán|ka*. Grouping them in pairs so that each pair forms an iambic foot would be the natural way to break up the monotony of the sequence, hence *nér|ciqsúg|narqán|ka* 'I will probably eat them'.

[18] Miyaoka partially disagrees with Jacobson on this point. Miyaoka's rules predict either (conservative) *qán|rut|kanka* or (innovative) *qán|rutkan|ka* in opposition to only *qán|resqán|ka*. Jacobson's rules, however, do not allow for Miyaoka's form *qán|rut|kanka* in GCY. More research is apparently needed on this point, since this is precisely where NSK may also diverge from GCY.

This rule is different from those previously presented in that it begins with feet that are already defined and redefines them. It is therefore not a proper FD rule, but what could be called a "post-FD" rule.

If we disregard *e*-deletion for the moment, we find that it is possible to restate the last two rules by combining them in a way which is simpler and does not require foot redefinition:

> **(C)VC|CV| FD:** *A light closed syllable is defined as a foot before a light open syllable, unless the light open syllable is followed by word or enclitic boundary.*[19]
> *PA: stress.*

This obtains the same results (except in certain cases where *e*-deletion has taken place) as both the previous rules together, predicting a different foot configuration in *qán|rés|qaqa* from that in *qán|resqán|ka* (where the last rule does not apply). Both Miyaoka's and Jacobson's descriptions of CY prosody employ this rule. The simplicity of this formulation, however, is gained at the cost of greater complexity in the description of *e*-deletion. Note also that this rule, like the L|H| FD rule, requires forward scanning to see if it is to apply.

8. Alutiiq: Compression and tense/lax allophones of voiced fricatives

During the evolution of the Alutiiq prosodic system there have been two major phonological developments which affect the consonant system, both resulting in weak and strong varieties of consonants. The first development resulted in tense/lax allophones of voiced fricatives. This allophony is not synchronically active in Alutiiq but has evolved into a set of dialectally divergent morphophonemic rules, i.e., rules for devoicing and dropping of fricatives. The second development, fortition, is a synchronically active phonological process in all Alutiiq. In this section we explore the relationship between an early rule shortening heavy syllables (compression) and the phenomenon of tense/lax allophones of voiced fricatives.

In chart one, we see that in Naukanski and CSY the phonetic length of a vowel pair is shorter in closed syllables than in open syllables.[20] In HBC, Nunivak CY, and Alutiiq, this tendency has been taken to the extreme of shortening vowel pairs in closed syllables so that they have the same length as single vowels. Such shortening is here called **compression** of heavy syllables. In HBC, compression does not operate in word-final syllables, but in Nunivak and Alutiiq compression operates in all word-final heavy syllables, whether closed or open.

This simple phonetic process had the effect of exposing a fundamental dichotomy between accented and unaccented foot types. The Nunivak and Alutiiq rule for phonetic vowel length in heavy syllables is identical with that for iambic lengthening in the final syllable of an iambic foot:

> **Phonetic vowel length in accented syllables (Nunivak CY, Alutiiq):** *the vowel or vowel pair is (a) followed by gemination if* e, *(b) long if the syllable is open and non-final, and (c) short if the syllable is closed or word-final.*

A consequence of this rule is that initial closed heavy syllables are shortened so that #(C)VVC| is no longer phonetically distinguishable from #(C)VC| where VV is a pair of identical vowels. In either case the initial closed syllable is stressed, due either to the H| FD rule or to the #L| FD rule.

[19] Special rules pertaining to the enclitic boundary and *e*- deletion in conjunction with the CVC|CV rule are not discussed here; for full treatment see Jacobson's and Miyaoka's articles in this volume.

[20] Miyaoka's rules also predict that this is at least partially true in GCY, e.g. that *ia* of *akiatni* is shorter by one mora than that of *akiani*, although I have not observed this to be the case. This point could be resolved by instrumental analysis.

Since compression results in loss of length contrast between closed H| and L|, we could expect that where compression occurs, either the contrast between these two foot types will be neutralized under certain conditions, or the contrast will be maintained by the development of other phonetic indicators of syllable weight, such as differentiation of stress. The former case, neutralization of contrast, prevails in Nunivak CY (see Jacobson, this volume), and occurs to a more limited extent in HBC CY and KA. According to Jacobson, *tupag|ciiq|nia* 'he says she will wake him' appears to be homophonous with *tupag|ciq|nia* 'he says she will awaken' for some HBC speakers; the same appears to be true in at least some Kodiak KA. Elsewhere (in some HBC and the rest of Alutiiq), the underlying contrast between word-internal closed H| and L| is maintained by differentiation of stress: L| has weaker stress than H|. Woodbury (1984b: "Meaningful Phonological Processes: A Consideration of Central Alaskan Yupik Eskimo Prosody," as yet unpublished; note 9) also notes a process operating in Chevak, CY whereby some word-internal L| are destressed and lowered in pitch. The phonetic realization of such L| is strikingly parallel to that found in CA.[21] The phonetic contrast between open H| and L| is also maintained by the fact that open H| is phonetically long, whereas open L| is short, and in CY closed with the geminate of the following consonant.

Compression has thus led to a division of foot types into two categories in Alutiiq, which we call accented and unaccented feet. The accented type (H| and LL|) has strong stress and is subject to a lengthening rule which can be stated generally so as to cover both foot types. The unaccented type (non-initial L|) has weak stress and a different lengthening (gemination) rule. This grouping, however, is not yet formally complete because of the indeterminate status of #L|. Closed #L|, as shown above, has become phonetically indistinguishable from closed #H|, and thus must be considered an **accented** foot type. Open #L|, on the other hand, occurs only before H|, where it is closed with the geminate of the following heavy syllable-initial consonant. Thus open #L|, like open non-initial L|, undergoes gemination rather than the lengthening rule characteristic of an accented foot, in this respect behaving like an **unaccented** foot. In the next section we shall see how this indeterminacy in the status of #L| is resolved in Alutiiq.

In early Alutiiq, the phonetic difference between non-initial L| and H| (weak stress vs. full stress) was probably already reinforced by a difference in the articulation of the foot-initial consonant: the initial consonant of H| was articulated with greater tension. Voiced fricatives in particular developed tense/lax allophones which were distributed as follows:

> **Consonant tension in Alutiiq:** *A voiced fricative is lax if it is not geminated and heads an unaccented syllable; elsewhere it is tense.*

Thus the tense allophone was found (a) syllable-finally, (b) where the fricative was geminated, and (c) at the head of a heavy syllable.

As the CA and KA dialects diverged, these two allophones had different fates. The tense allophones tended to become devoiced in KA (*g* and *r* are devoiced in all KA, and the remaining voiced fricatives are devoiced in Perryville and Afognak KA, and in lexicalized instances also in the rest of KA.)[22] Elsewhere in KA and in CA, the phonetic difference between these two allophones has been neutralized, except in the case of CA *w* and PWS CA *y*, which retain the allophonic variation [ɣʷ]~[w] and [ɣʲ]~[y] according to the ancient rule.

[21] Where such a stress differential occurs, it can perhaps best be accounted for by positing that the non-initial L| foot has been subordinated to an adjoining foot, forming a larger foot-like structure. Woodbury (1984b, note 9) and Leer ("Toward a Metrical Interpretation of Yupik Prosody," this volume) have independently evolved such an explanation of stress differentiation in Chevak CY and Alutiiq.

[22] Syllable-final *y* is also devoiced to *s* in all KA. In Nunivak, the same phenomenon of tense/lax allophones of voiced fricatives has also led to devoicing of voiced fricatives, as in Perryville and Afognak KA, but the conditions of the rule are different. In Nunivak, a voiced fricative is devoiced only where geminated.

The lax variety of voiced fricative has tended to drop in Alutiiq. At first, fricative dropping was probably confined to *g* and *r*, as it is in KA. In CA, however, intervocalic dropping of the other voiced fricatives is also found.[23] Where fricative dropping occurs following a vowel, the result is a non-initial light syllable with zero initial consonant: (V)V.XV(C). → (V)V.V(C), where X is *g* or *r*. Following a consonant, however, fricative dropping results in gemination of the consonant: (V)VC.XV(C). → (V)VC.:V(C).

The fact that compression is found in other AY dialects peripheral to GCY (Nunivak and HBC) as well as Alutiiq, and that devoicing of what originally was the tense allophone of a voiced fricative is found in Nunivak as well as Alutiiq, indicates that these developments occurred at a time when AY was a true dialect chain, and Alutiiq was only beginning its independent evolution.[24] The following sections can describe the steps in the internal evolution of Alutiiq and its differentiation into dialects.

9. Alutiiq: Development of fortition

In this section, we discuss the evolution of fortition as a phonetic attribute of the accented foot in Alutiiq, and the resolution of the status of #L| as an accented foot. The crucial factor common to both these developments is a rule which degeminates stops following an unaccented vowel. This rule is confined to Alutiiq and must have arisen following the separation of Alutiiq from the rest of AY. The form of the rule is as follows:

> **Degemination (Alutiiq):** (C)VC.: → (C)V.C, *where V is unaccented.*

Thus where fricative dropping following a consonant has resulted in a geminated consonant, the consonant remains geminated only where the preceding vowel is accented, as shown by the postbase *-n'ite-* (negative) in KA *pín|'i|tuá* [pín.:i...] 'I'm not doing it', *íq|llun|tuá* [íq.ɬu.ni·...] 'I'm not lying', and *íq|llu|nitiiq* [íq.ɬu + ni..] 'she's not lying' (where + denotes fortition of the following consonant).[25]

The other source for gemination following an unaccented vowel is the L|H| FD rule. Where L| is an open syllable previous to the application of the FD rules, it is closed with the geminate of the following consonant. In this case we find that gemination is retained if L| is word-initial, but degemination occurs if L| is non-initial, as in *pím|aá* [pím.:á] 'she must have done it to him', *íq|llu|maá* [íq.ɬu + má] ← *[íq.ɬu$má] 'she must have lied to him'. This rule thus necessitates the definition of #L| as an accented foot in order to account for the retention of gemination. If #L| is accented and open here, however, then we would expect that the vowel would be accentually lengthened, giving *[pí:.má]. Since this is not the case, we must write a special rule for the word-initial case of L|H| FD in Alutiiq, so as to incorporate the gemination as part of the rule:

> **#L|H| FD (Alutiiq):** *An initial light open syllable is closed with gemination of the consonant of a following heavy syllable.*

The above rule is a pre-FD rule ordered before the #L| FD rule, which subsequently defines

[23] For details, see section 2.4 in this article and section 2.2 of "Prosody in Alutiiq," this volume.

[24] Comparative lexical work has also shown that Alutiiq and Nunivak (and to a lesser extent also HBC CY) share a significant amount of vocabulary not found elsewhere in AY; this suggests an early southern/coastal chain configuration of dialects (Alutiiq, Nunivak, HBC CY) which were in the process of differentiating from northern/interior AY (GCY plus NS CY). See the introduction to the Central Yup'ik dictionary, Jacobson ed., pp. 32-37.

[25] In Perryville KA, it is evident that the degemination rule is later than the devoicing and fricative dropping rules, since e.g. *nuu|nilgu|rtuq* → *nuu|nil.:u|rtuq* → *nuu|nill.:u|rtuq* → *nuu|ni.ɬu|rtuq* 'there are getting to be a lot of porcupines', cf. *nuu|nill|guuq* 'there are a lot of porcupines'.

#L| as an accented foot.[26] This, then, is historically the second rule confined to word-initial sequences in Alutiiq, the first being the #L| FD rule itself.

Because of the degemination rule, then, gemination is no longer a PA of the non-initial L|H| FD rule in Alutiiq, which now has the form

> **Non-initial L|H| FD (Alutiiq):** *A non-initial light syllable preceding a heavy syllable or word boundary is defined as an unaccented foot.*

In a case like *iq|llu|maá*, we find that there is a phonetic alteration of the H|-initial consonant in Alutiiq, which we call **fortition**. The *m* is somewhat longer than it would be at the head of an unaccented foot or at the head of the second syllable of an iambic foot, although not so much as to close the preceding syllable.

In this case, fortition appears to be a vestigial phonetic remnant of the former gemination. However, fortition also occurs H|-initially following an accented foot, as in *patú|maá* 'she must have covered it'. This may indicate rather that fortition is a phonetic descendant of the older tense allomorph of H|-initial consonants (which, it will be recalled, was also the precursor to devoicing of fricatives in KA). In either case, fortition eventually spread in Alutiiq so that it applied to iambic foot-initial consonants as well, as for example in *alí|kaqá* 'I am afraid of him' and *nák|lle|kaqá* 'I have compassion for him'. Here foot-initial *t* is attenuated (closed noticeably prior to release) and fully voiceless.

Word-initially, however, no contrast is possible between fortis and lenis foot-initial consonants in Alutiiq. Since all word-initial feet (H|, LL|, #L|) are accented in Alutiiq, then if we stipulate that all word-initial consonants are fortis, we obtain the generalization that **all accented-foot-initial consonants are subject to fortition**. Thus in Alutiiq there are three PAs which apply to accented feet in general: (a) stress, (b) accentual lengthening/gemination of open syllables, and (c) fortition of foot-initial consonants. The unaccented foot (non-initial L|), on the other hand, has stress in KA but not in CA, and it undergoes neither lengthening, gemination nor fortition of the initial consonant. The distinction between the accented and unaccented foot types is thus complete.

10. Alutiiq: Stressed Ce(C).

Alutiiq also has an *e*-deletion rule which is identical to the GCY *e*-deletion rule except that it applies only to word-initial (C)V.C*e*. and is not blocked where the consonants flanking *e* are identical:[27]

> **Initial e-deletion (Alutiiq):** #(C)V.C*e*. → #(C)VC.

Like the #L|H| FD rule, this rule results in an initial light closed syllable, which is then defined as an accented foot by the #L| FD rule. This rule, together with the #L|H| FD rule, thus forms a special class of pre-FD rules which feed the #L| FD rule in Alutiiq. It should be noted at this point that the rules defining the first foot in the word are the same in all Alutiiq. The remaining rules to be discussed below concern non-initial FD and differ dialectally within Alutiiq.

An important effect of both the KA and CA rules is that they largely avoid accentuation on voiceless syllables. Because voiceless *e* is deleted in initial (C)V.C*e*, and never accented in non-initial (C)V(C).C*e*, gemination of the consonant following accented C*e* never occurs in Alutiiq where *e* is voiceless, as it does where *e* is voiced. In other words, these two facts conspire

[26] Pre-FD rules do not assign foot boundaries and apply before the FD rules proper.

[27] It is not clear whether the Alutiiq initial *e*-deletion rule is a direct historical descendant of the GCY *e*-deletion rule, an areal diffusion, or a case of parallel evolution in Alutiiq. The similarity of the two rules suggests perhaps that both originated at a time when AY was still a dialect chain, i.e. before Alutiiq became a separate language.

in Alutiiq to eliminate the sequence [C$_{\text{ę}}$C.:] altogether. In CY, on the other hand, this sequence is quite permissible.

The phenomenon I call **e-quiescence** concerns primarily the prosodic behavior of voiceless syllables (i.e. syllables containing voiceless *e*), and to a more limited extent also voiced syllables of the form C*e*. A good example of the type of stress perturbation found with voiceless syllables is *piqé̱r|tu|qakí* 'if she strikes them repeatedly'. Phonetically, this word is (weakly) stressed on the first syllable ([pí.qə̱x]) in all dialects of Alutiiq. This does not mean, however, that *pi* is defined as an accented foot, for in this case we would expect accentual lengthening of *i*, and subsequent foot definition would be different. In KA, it is possible to say that the sequence *piqé̱r|* is phonetically identical with *pi|qe̱r, since L|* feet are weakly stressed in this dialect (unless of course they are voiceless). Note, however, that in CA, where L| feet are not phonetically stressed as in KA, this generalization is not true.

Where such a sequence is word-internal, we find in KA that a most interesting foot definition rule treating voiceless syllables has evolved due to the fact that (C)V(C).C$_{\text{ę}}$(C)| is phonetically indistinguishable from (C)V(C)|C$_{\text{ę}}$(C)|. Taking an example like *naá|qisté̱|sináq* = *naá|qis|te̱|sináq* 'big reader' (where again, *qis* is weakly stressed and moreover, *s* is not geminated), it is not immediately apparent which interpretation is to be preferred. However, if we compare this with *naá|qis|te̱ksú|'arpét* 'we want him for a reader', we see that foot definition around voiceless syllables differs from that around voiced syllables by comparison with e.g. *uq|niwí|sináq* 'big hot water container' and *iq|niwík|su|'arpét* 'we want it for a hot water container'.

Without proliferating examples to demonstrate how we reached our conclusions, we arrive at a rule which avoids word-internal CV(C).C$_{\text{ę}}$(C)| in KA by defining one or more syllable as L| until the voiceless syllable (or sequence of voiceless syllables) which would otherwise be accented has been bypassed. We see this in *naá|qis|te̱ksú|'arpét, where qis* is defined as L|, thus avoiding accent on *tek* (here we may say that the accent has "advanced" to the following syllable *su*). In the case of *naá|qis|te̱|sináq*, accent on the syllable *si* is also avoided, but for a different reason: *-sinaq* 'big N' is a disyllabic postbase composed of two light syllables (see section 11). In this case, then, both *qis* and *te* are defined as L|, so that the accent "advances" past both *te* and *si* to the syllable *naq*.

The following rather simple rule, in collaboration with other L|-definition rules in KA, accounts for foot definition around voiceless syllables and syllables with quiescent voiced *e*:

> **L| definition before a voiceless or quiescent syllable:** |(C)V(C). → |(C)V(C)|/__ C*e*(C).., *where* e *is voiceless or quiescent.*

The statement of this rule must be modified to describe the prosodic behavior found with a few Perryville speakers (see section 4.3.2.2 of "Prosody in Alutiiq" in this volume). Note that this rule is stated so that it applies only word-internally. If we try to apply it in a case like *piqertuqaki* above, this rule incorrectly predicts **pi|qe̱rtú|qakí* instead of *piqé̱r|tu|qakí*. It would appear, then, that word-initial unaccented L| can not be permitted, and that word-initial feet of the form ((C)V.)C$_{\text{ę}}$C. must be allowed.[28]

A related phenomenon in KA is illustrated by the existence of prosodic alternants in Perryville KA for what is underlyingly *tuqulinesinaq* 'big dead tree': *tuqú|liné|sináq* (where *e* is audible and *s* is geminated) and *tuqû|lin|sináq* (where *e* is not audible). In the second alternant (the only observed form in KA outside of Perryville), we say that *e* is quiescent, and it behaves like voiceless *e* according

[28] It would be possible to create special-case initial FD rules which define #((C)V.)C$_{\text{ę}}$C. as #((C)V|)C$_{\text{ę}}$C|, but for various reasons, this alternative has not been taken here. Although such a pair of rules would permit us to generalize that accented voiceless C*e*C(C) does not exist in Alutiiq, it would create exceptions to the (no less desirable) generalization that all initial feet are accented. In short, the cost of either generalization is the integrity of the other one.

to the above rule, hence *tuqú|li|ne|sináq*. But since *e* is not audible as such, this is phonetically equivalent to *tuqú|lin|sináq*. Where *e* is voiceless, as in *áp|ru|tę|sináq* = *áp|rut|sináq* 'big road', this same neutralization of contrast between |(C)V|C*e*| and (C)VC| is found. Here, however, *áp|rutę|sináq* is not distinguishable from *áp|ru|tę|sináq*, as we have noted above, so that alternate pronunciations cannot be distinguished as with *tuqulinesinaq*. I use the name *e*-quiescence as a loose cover term for this phenomenon and that described above; see further sections 2.4 and 4.3 of "Prosody in Alutiiq" in this volume.

CA also has a rule which, like the KA L| definition rule given above, has the effect of avoiding accented voiceless syllables. This rule also operates in much the same way as the above rule, but with one important difference: the foot created by the rule undergoes accentual lengthening and fortition of the foot-initial consonant. Thus the resulting foot is accented, unlike the foot produced by the KA rule, which is unaccented.

> **Non-initial Ĺ| FD before a voiceless syllable (CA):** (C)V(C). → (C)V́(C)| (C)V(C)/__C*e*(C).

Compare e.g. *akú|tar|yugtú|kut* 'we want some *akutaq* (a dessert)' and *akú|táng|qęr|tukut* 'we have some *akutaq*', and *iqúk|llí|tęll|raa* 'it reached the end', where *i* of *lli* is accentually lengthened.

Thus in CA we see the appearance of a specialized foot type, the non-initial accented monosyllabic light foot (Ĺ|). Whereas in KA accented and unaccented monosyllabic light feet are in complementary distribution (accented #L| word-initially, unaccented L| non-initially), in CA this is no longer the case: accented Ĺ| can occur both initially and medially. In the following section we shall further see the development of a new foot type (unaccented H|) in PWS CA.

11. KA: L|LL| FD and accent-advancement

In both KA and CA, the FD rule defining non-initial unaccented L| before a sequence of two light syllables restricts it from applying more than once in succession. In KA, where unaccented L| is also produced by the rule that avoids accented voiceless syllables (see section 10), we find sequences of more than one L| due to a combination of L| definition rules. In CA, however, we may make the generalization that an unaccented foot occurs only before an accented foot, i.e. in the sequences L|Ĥ|, L|Ĺ|, L|LĹ|, or word-finally.

Setting aside the KA L| definition rule given in section 10, there are two L| definition rules found in Alutiiq: the L|H| rule and the L|LL| rule. The L|H| rule is the same in all Alutiiq, but the L|LL| rule is considerably more complex in KA than in CA. In CA, non-initial $L_1L_2L_3$ is footed $L_1|L_2L_3|$ unless there is an enclitic boundary between L_2 and L_3, or L_3 contains voiceless *e*. In KA, however, the operation of the rule depends on the morphological structure of a particular non-initial morpheme or section of a word. Disyllabic postbases occurring with the phonemic shape LL are always footed LL|. Thus in KA *aí|wi|kutár|tuq* 'he's going to set off by boat', *wi* is defined as L| before the postbase *-kutar-* 'be about to V', and we say that the first syllable of the postbase (*ku*) is **accent-advancing**. Furthermore, the inflectional part of the word together with certain postbases which typically precede it form a section of the word on which the accent-advancement rule operates.

A hypothesis which could account for the historical evolution of this rule is that accent-advancement could stem from the earlier existence of pairs of intonational variants of words, particularly in clause-final position. This hypothesis is based on the observation that in Perryville KA and PWS CA, such intonational variants exist in words ending with $|L_1L_2$. In the unmarked variant, L_2 is stressed unless breath flow is diminished. In the marked variant, L_1 is stressed and raised in pitch and L_2 is unstressed. Thus in Perryville KA, L_1 has the same degree of stress and pitch as word-internal L|, and L_2 is unstressed, like word-final L|. Hence the marked

variant is prosodically redefined as $|L_1|L_2$, e.g. *án|luní* (unmarked variant) ~ *án|lu|ni* (marked variant) 'he is going out'. The marked variant appears to give some sort of emphasis to the phrase or clause in Perryville KA.

In PWS CA, a word followed by pause has two possible intonation contours. The first signals that the discourse unit (sentence, clause, phrase) is not complete, and additional information follows. The second (marked variant) concludes the discourse unit. The marking consists simply in destressing a final accented syllable. With words ending in $|L_1L_2$, however, if the marked variant is emphasized, L_1 is stressed and raised in pitch proportionally with the degree of emphasis. The phonetic realization of the emphasized marked variant is thus similar to that of the Perryville marked variant.

Nunivak CY also has strikingly similar intonational variants of word-final $|L_1L_2$ (see Woodbury 1985, sec. 2.2). In the unmarked (sentence-internal) variant, both syllables are unstressed, and in the marked (sentence-final) variant, L_1 is stressed and, if open, closed with gemination of the initial consonant of L_2, L_2 being unstressed.[29] Here again L_1 is phonetically identical with word-internal L| (which is accompanied by gemination in CY), and L_2 is phonetically identical with word-final L|. Thus, as in Perryville KA, the marked variant is phonetically identical with $|L_1|L_2$; we find, e.g. *án|luni* (unmarked) ~ *an|lú|ni* [án.lún.:i] (marked).

We should note at this point that the prosodic alternation between $|L_1L_2$ and $|L_1|L_2$ here is identical with that discussed in section 10. The conditions resulting in such alternants are quite different, however. In section 10, these alternants were found in KA where L_2 contains voiceless or quiescent *e*; here the alternation is conditioned by discourse factors.

From here on the reasoning becomes speculative. Let us suppose that this same type of prosodic variation were allowed to extend to sequences of three word-final syllables. An original sequence $|L_1L_2|L_3\#$ (an iambic foot followed by an unaccented foot) would then have had a marked prosodic variant $|L_1|L_2|L_3\#$, e.g. (unmarked) **án|ciqú|kut* ~ (marked) *án|ci|qu|kut* 'we will go out'. It would then be possible for $|L_2|L_3\#$ to be reinterpreted as the marked variant of $|L_2L_3\#$, so that the unmarked variant of the complete sequence would be reinterpreted as $|L_1|L_2L_3|$, and the above example would be (unmarked) *án|ci|qukút* ~ (marked) *án|ci|qu|kut*.

However accent-advancement arose in KA, it is unlikely that it was motivated by purely phonological conditions (i.e. applied to all word-final sequences of $L_1L_2L_3$). Instead, it may have served to regularize the prosodic shape behavior of morphemes or lexicalized clusters of morphemes of the form LL so that these are always footed LL|, as is the case with disyllabic postbases in modern KA. Thus we find minimal pairs in KA like *píq|rutá|qa* 'my bat' (with the possessive ending *-ka*) and *píq|ru|taqá* 'I am hitting it against something' (with the transitive ending *+(g)aqa* < *+ (g)ar/-ka*). By comparison with a form like *tuqú|taqá* 'I am killing it', we see that accent-advancement in *píq|ru|taqá* has the effect of causing the ending *-aqa* to be footed LL|, as it is in *tuqú|taqá*. Similarly, in both *qayá|sináq* 'big baidarka' and *éng|lu|sináq* 'big house', the disyllabic postbase *-sinaq* 'big N' is footed LL|.

This use of accent-advancement to allow word-final disyllabic morphemes to be consistently footed LL| could then have been extended leftward, so that it could occur in word-medial sequences as well, e.g. in *éng|lu|siná|qa* 'my big baidarka' (cf. also the conditional endings *-ku-ni* and *-ku-ni-ki* in *iq|llu|kuní* 'if she (refl.) lies' and *iq|llu|kuní|ki* 'if she (refl.) lies to them').

At this point, however, the parallelism between disyllabic postbases (such as *-sinaq*) and inflectional endings (such as *-aqa* and *-kuni*) breaks down. Whereas *-sinaq* remains a disyllabic postbase when it is followed by an inflectional ending, the addition of *-ki* to *-kuni* results in a trisyllabic inflectional ending *-kuniki*. With an ending of more than two syllables $L_1L_2L_3(L_4)$, if accent-advancement does not occur so as to define $L_1L_2|$ as a foot, it may instead occur so as to define $L_2L_3|$as a foot. Thus in KA we find *patú|ku|niki* 'if she (refl.) covers them' (rather than **patú|kuní|ki*) in contrast with *qayá|siná|qa* 'my big kayak'.

[29] Jacobson 1984, p.37, and personal communication from Jacobson.

To handle this, we posit an **accent-advancing boundary** before the ending, and state that accent-advancement can operate at the first point to the right of this boundary where the rules will permit it. This boundary delineates the accent-advancing final portion of the word, which at first may have included only the inflectional ending, and subsequently extended leftward to include certain postbases (such as *-ciqe-* 'future') which characteristically precede inflectional endings. In KA the accent-advancing portion of the word rarely includes more than four syllables.

Thus, if the original function of accent-advancement was to regularize the footing of morphemes and lexicalized morpheme clusters composed of light syllables, this function is still apparent with disyllabic postbases, but with the final inflectional portion of the word, accent-advancement has spread so that it can result in more than one possible footing of the ending. The KA accent-advancement rules must thus be stated in terms of the shapes and categories of morphemes within the word. The rule is further restricted in that accent-advancement does not occur where it would result in a foot $L_1L_2|$ where L_2 contains the vowel *e*. Because of its complexity, the rule will not be given here; the reader is referred to sections 3.3.3 and 4 of "Prosody in Alutiiq" in this volume.

12. CA: L|LL| FD and evolution of Ĺ| and LL|

The KA L|LL| FD (accent-advancement) rule is undoubtedly the most complex of the Yupik prosodic rules, in view of the heterogeneous morphological conditioning that determines which syllables are accent-advancing. It is no wonder, then, that this rule is simplified by generalization in CA, as were also the #L| FD rule in AY and the (C)VC|CV| FD rule in CY.

> **L|LL| FD (CA):** *After the first foot in the word is defined, in a sequence* $L_1L_2L_3$, *where* L_2 *and* L_3 *are not separated by an enclitic boundary,* L_1 *is defined as an unaccented foot. This rule can apply only once in succession, so that* $L_2(L_3)$ *must be defined as an accented foot.*

In contrast with the KA variant, morphological structure is not a factor in the CA variant of this rule. The rule has been simplified in CA so that L_2 is always accent-advancing. Thus the KA prosodic contrast between forms like *piq|rutá|qa* 'my bat' and *piq|ru|taqá* 'I am hitting it against something' is not possible in CA, where both forms are *piq|ru|taqá*. Furthermore, disyllabic light postbases do not always form a iambic foot in CA as they do in KA, e.g. (KA) *án|kutár|tuq*, (CA) *án|ku|tartúq* 'he is going to go out'; (KA) *áq|'alá|qutár|tuq*, (CA) *áq|'a|taqú|tartúq* 'he is going to fall in the water'.

Another major CA innovation, the rule for non-initial Ĺ| FD before a voiceless syllable, has already been discussed in section 10. This rule applies before the iambic FD rule, so that the sequence L_1L_2 can be defined as an iambic foot only where L_2 is voiced. Compare, for example, CA *usú|'a|nakllú|ku* 'finding it cold' and *usú|'a|ná|keg|kuná|ku* 'not finding it cold'. This rule thus provides a means for avoiding accented voiceless syllables by truncating the iambic foot, giving rise to non-initial Ĺ| in CA. Being accented, this foot type begins with a fortis consonant and is stressed and accentually lengthened if open. Thus $CV_1\acute{V}_1(C)|$ is phonetically indistinguishable from its heavy counterpart $CV_1\acute{V}_1:(C)|$. Here then, as with initial Ĺ|, the distinction between underlyingly light and heavy feet is neutralized.

The remaining CA FD rules deal with the prosodic evolution of light syllables whose initial fricative is dropped (i.e. V(C).). Following a light open syllable, two foot redefinition rules are found in CA.

> **Contraction of CV.V́(C)| (CA):** CV.V́(C)| → VV́(C)
>
> **Contraction of CV|V(C) (PWS CA):** CV |V(C).CV́(C)| → CVV(C)|CV́(C)

Since both these rules involve redefinition of the sequence CV.V(C), they are best treated as post-FD rules. In the second rule, restricted to PWS CA, we find another environment where non-initial Ĺ| arises. In addition, a new type of foot, the unaccented heavy foot (H|) makes its appearance in PWS CA. This foot type is unstressed and lacks initial fortition.

Thus, whereas in KA the possible foot types (L|, H|, LL|) are the same as those found in the rest of AY, in CA Ĺ| can occur both word-initially and non-initially, and so must be distinguished from unaccented L|. With the addition of unaccented H| in PWS CA, we arrive at a prosodic system which includes the foot types L|, H|, Ĺ|, Ḧ|, and LĹ|. The phonemic contrast between Ĺ| and Ḧ| is partially neutralized, since $CV_1\acute{V}_1(C)|$ is phonetically indistinguishable from $CV_1\acute{V}_1(C)|$. These foot types may therefore be classified as unaccented monosyllabic (L| and H|), accented monosyllabic (Ĺ| and Ḧ|), and accented disyllabic (LĹ|). The unaccented foot types are restricted to non-initial position and must be followed by accented feet.

Thus in CA, and particularly in PWS CA, we find the unaccented heavy syllable to be the eventual development of consonant lenition: where a lenis voiced fricative is dropped between single vowels, $(C)V_1.V_2(C). \rightarrow (C)V_1V_2(C)|$, whether V_2 is accented or unaccented. This historical sequence parallels that which we found at the point where Yupik diverged from Inupiaq. Here also lenition of stops and fricatives resulted in the sequence (C)VV(C) where fricatives drop between single vowels. As in PWS CA, such sequences were defined at this early stage of Yupik as monosyllabic heavy feet. Ironically, then, the earliest evolution of Yupik prosody was accompanied by a process of redefining two light syllables as a heavy syllable, and this process seems to be repeating itself in a modified form at the southeasternmost edge of the language family, just as prosodic development itself is coming to an end in this dying dialect.

Conclusion

In the transition between Proto-Eskimo and Alaskan Yupik, we have seen three major prosodic developments:

1. Consonant lenition leads to dropping of intervocalic voiced fricatives, which results in heavy feet.

2. *e*-deletion results in L| FD that is not predictable from the surface syllable structure; this surface unpredictability is eliminated by a generalized #L| FD rule.

3. Neutralization of length contrast in heavy syllables requires a separate L|H| FD rule with associated L|gemination to maintain a phonetic contrast between (C)V.CV(C)| and (C)V.CVV(C).

All three of these prosodic developments are mirrored in subsequent prosodic evolution in AY. In Alutiiq, the evolution of a new consonant tense/lax contrast has resulted in fricative dropping. This process culminates in the redefinition of these later (C)V.V(C). as heavy feet in PWS CA.

The PY *e*-deletion rule (C)V.C*e*. → (C)V́C|, which resulted in a generalized initial closed L| FD rule in AY, is also reflected in the subsequent *e*-deletion rules of CY and Alutiiq. In CY, *e*-deletion leads to a closed L| FD rule quite similar in form to the initial closed L| FD rule of AY. In Alutiiq, the *e*-deletion rule is much more limited in scope, but also results in a closed L| FD rule in KA. In Alutiiq we also find what appears to be a related set of rules which have the effect of avoiding accentuation on syllables containing voiceless *e*.

The third development, neutralization of length contrast in heavy syllables, has become part of a larger process which we call compression in HBC and Nunivak CY and Alutiiq. Compression has had several important prosodic results. The phonetic length contrast between initial closed

light and heavy syllables has been neutralized, and in Alutiiq, vowel length is simply a redundant phonetic manifestation of accent (except in loans). Together with degemination, compression has resulted in bifurcation of the L|H| FD rule into an initial rule and a non-initial rule in Alutiiq. The initial rule (#L|H| FD) can thus be paired with the Alutiiq initial *e*-deletion rule, resulting in a special class of Alutiiq pre-FD rules which create an initial light closed syllable. This syllable is then defined as an accented foot by the #L| FD rule.

The only AY prosodic development which appears not to be related to the above three processes is the Alutiiq L|LL| (accent-advancing) FD rule. Its highly idiosyncratic nature in KA seems to point toward an origin involving the final portion of the word; hence its evolutionary origin is sought in intonational perturbation of the word-final iambic foot. Further development of this rule in KA is attributed to avoidance of accented syllables containing *e*, and to a conspiracy which has the result that disyllabic light postbases are consistently defined as iambic feet in KA.

In CA, the accent-advancing rule is generalized so that L| FD always occurs before a sequence of two light syllables (unless there is an enclitic boundary between them). The generalization of this rule is strongly reminiscent of the generalization of #L| FD in AY and L| FD in CY, both of which stemmed from an earlier *e*-deletion rule.

TOWARD A METRICAL INTERPRETATION OF YUPIK PROSODY

Jeff Leer

1. Introduction

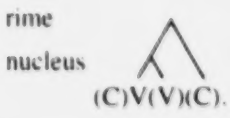
When I prepared the first draft of a paper on Yup'ik prosody in 1977, I employed a basically linear stress-predicting approach, which I continued to develop and modify during the writing of my papers on Alutiiq prosody and comparative Yupik prosody in this volume. After these two papers were essentially finished, I began to consider the current literature on metrical phonology (e.g. Hayes 1981), to see to what extent these recent developments in theoretical framework could offer significant insights into the Yupik prosodic systems.

I found, perhaps not surprisingly, that metrical solutions for Central Siberian Yupik and Central Alaskan Yupik, while making possible a somewhat more elegant statement of the rules, do not crucially improve our description and explanation of these relatively simple prosodic systems. In the case of Alutiiq, on the other hand, the non-linear approach does lead to important fresh insight into this much more complex prosody. This treatment of Alutiiq prosody suggests certain adjustments of the model itself which may be of theoretical interest.

More specifically, the existence in Alutiiq of three levels of stress, together with the phenomenon of fortition, calls for a metrical description involving a level of prosodic structure intermediate between the foot and the word tree, which I call here the **superfoot**. I further found that in Chugach Alutiiq (CA), the pitch level of fully stressed syllables could be handily predicted by assuming an even higher level of prosodic structure, which I call the **pitch group**. Since more than one pitch group can occur in a word, this level of organization must also be below that of the word tree. The description of Alutiiq prosody given in this paper therefore is of potential theoretical interest, in that the assumption of two levels of prosodic structure higher than the foot level and lower than the word tree level is supported by clear phonetic evidence.

2. Syllable structure

Except Miyaoka, the authors of this volume's papers assume (C)V(V)(C) as the canonic shape of the Yupik syllable.[1] In terms of underlying structure, the rime projection of a syllable would then be



where in Central Siberian Yupik (CSY) and Central Yupik (CY), V(V)(C) is allowed only word-initially, and in Alutiiq V(C) is also allowed word-internally. In terms of the prosodic rules, it is not enough simply to distinguish between syllables with simple and branched rimes—we must maintain

[1] Woodbury (1984b, sec. 1) also uses this analysis. Miyaoka's theory differs in that branched nuclei are not allowed. Thus, in CY, Miyaoka considers heavy syllables to be iambic feet (weak-strong).

a distinction between syllables with simple and branched nuclei (light and heavy) on one hand, and open and closed syllables on the other.

I have slightly altered the usual graphic representation of the tree structure of the foot. The strong component of the foot continues in a vertical line and the weak components of the foot branch to the side. The same principle applies to higher prosodic levels. I also use horizontal lines to indicate prosodic levels lower than the word tree level. In CSY and CY these are the syllable and foot levels, and in Alutiiq also the superfoot and pitch group levels. Hence the iambic foot (elsewhere called the "rhythmic foot") is represented:

weak-strong

In the remainder of this paper, it is implicit that the horizontal lines above the examples represent, from bottom to top, the syllable, foot, superfoot, and pitch group levels, respectively. Dots representing strong nodes form a column with the corresponding rimes and asterisks of the grid.

3. CSY and CY rules

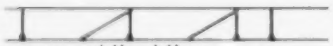
In my paper on Alutiiq prosody in this volume, I ordered the foot definition rules so that monosyllabic feet were defined first, leaving the definition of the default case, the iambic foot, until last. This ordering appears to be best suited to Alutiiq, but an alternate ordering proposed by Woodbury (1984b, sec. 1) provides a more elegant solution for CY and CSY. Iambic feet are formed by the first rule. Then, by the second rule, each remaining syllable is assigned to its own foot. Both heavy foot formation and monosyllabic light foot formation are thus treated simultaneously by the second rule.

Using this approach, we may state the CSY rules as follows:

CSY foot definition rules.

1. **Iambic foot rule.** Working from left to right, search for light syllables; a light syllable together with the following syllable (light or heavy) is defined as an iambic foot.
2. **Monosyllabic foot rule.** Define each remaining syllable as a monosyllabic foot (these are heavy syllables and stray word-final syllables).

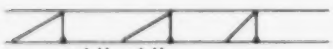
On the metrical grid, asterisk the strong node of each non-final foot. In words of only one foot, asterisk the initial syllable of the foot. Examples:



aangqaghllaghllangyagtuq

* * *

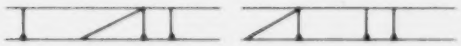
'he wants to make a big ball (*aangqaq*)'



angyaghllaghllangyugtuq

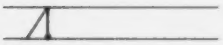
* * *

'he wants to make a big boat (*angyaq*)'



aangqaghllaaguq *angyaghllaaguq*
* * * *

(*-llaa-* lengthened) (*-llaa-* not lengthened)
'it is a big ball' 'it is a big boat'



nuna
*
'land'

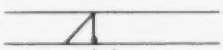
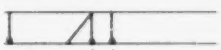
Although Woodbury's rules for CY foot definition are quite elegantly stated and give the proper results most of the time, they fail to produce the correct iambic feet in some cases where *e*-deletion has applied. The following restatement of the CY rules produces the correct results. However, it requires three left-to-right passes through the word, one for rule 1 and two for rule 2. I cannot see any simple way to obviate this approach.

CY foot definition rules.

1. **CVCV rule.** Working from left to right, search for contiguous pairs of light syllables where the first syllable is open and there is no enclitic boundary between the two syllables, i.e. (C)VCV(C).
   a. **E-deletion rule.** If the second syllable has the form C*e*, delete the *e* (thus closing the first syllable).[2]
   b. **Primary iambic foot rule.** Otherwise, define the pair of syllables as an iambic foot.

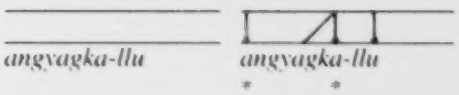
2. **Residual foot rule.** Working from left to right, examine sequences of syllables that remain undefined by rule 1.
   a. **Residual iambic foot rule.** Define each non-initial pair of light syllables as an iambic foot.
   b. **Monosyllabic foot rule.** Define each remaining lone syllable as a monosyllabic foot.

On the metrical grid, asterisk the strong node of each non-final foot.

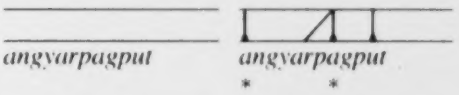
	After rule 1	**After rule 2**
angyamini 'in his own boat'	 *angyamini*	 *angyamini* * *
angyarpaka 'my big boat'	 *angyarpaka*	 *angyarpaka* * *

[2] This subrule does not apply in NSU and is restricted in the rest of CY except for HBC so that it does not apply where *e* is between homorganic consonants. In NSK and possibly for some speakers elsewhere in CY, it may be the case that the resulting syllable is defined as a monosyllabic foot at this point; the available data are not sufficient to resolve this question. However, if this qualification of the rule is true for NSK, it is possible to restate the rules for NS (both subdialects) so that only one left-to-right pass through the word is necessary.

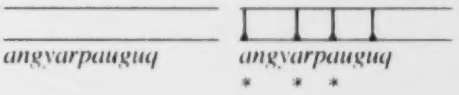
angyagka-llu
'and my two boats'



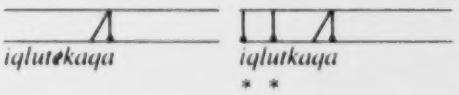
angyarpagput
'our big boat'



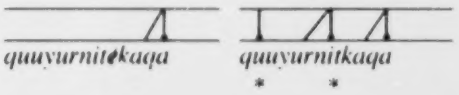
angyarpauguq
'it is a big boat'



iqlutekaqa
'I am lying about it'



quuyurnitekaqa
'I am smiling about it'



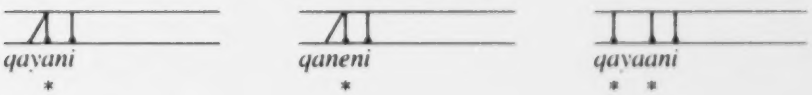
In CY, the most widespread intonation contour for the word is rising pitch until the strong node of the penultimate foot, then a rapid drop in pitch to the word-final syllable (which is unstressed). This can be accounted for by constructing a right-headed word tree above all but the final foot of the word:

'it is very good'

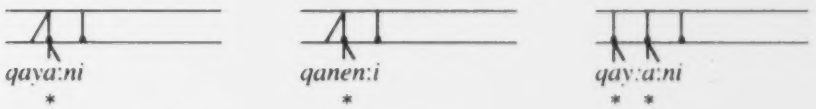
Here the second asterisk represents not extra stress, but the pitch peak of the word. (See section 4 in this paper for further examples of pitch level assignment with the metrical grid.)

Both CSY and CY have processes for phonetically "strengthening" syllables which have been marked strong by the above rules. One such process is phonetic lengthening of vowels in CSY (see rule 1 for CSY) and CY, and a second process in CY is phonetic closure of a short open syllable with the geminate of the consonant heading the following syllable. The CY rules are the more remarkable in that they collaborate in a way that can be generalized as follows: a syllable which is prosodically marked strong must have a branching rime in the surface phonetic form. Thus we find, for example,

Underlying forms



Surface phonetic forms



'his own boat' 'his own mouth' 'in his boat'

Hence one or the other process results in phonetic branching of the rime if and only if the rime of a strong syllable would otherwise be non-branching.[3]

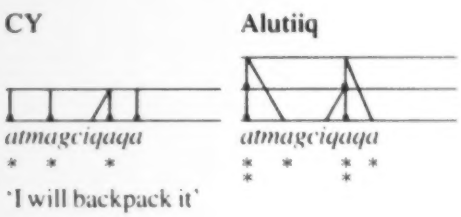
Such a generalization is not valid for CSY. If we compare, for example, CSY *qavaani* [qayá::ni] 'in his boat' with the CY form above, we see that whereas in CY *yaa* (already a branching rime) is not phonetically lengthened, it is lengthened in CSY. On the other hand, CSY both lacks gemination and does not allow lengthening of *e*, so that the strong syllable *ne* of *qaneni* 'his own mouth' cannot be forced to branch at the phonetic level.

In CY (and to a lesser extent also in CSY) then, we could say that strengthening of a weak syllable type by adding a phonetic augment to the syllable is, in effect, a **phonetic manifestation of the foot boundary.** That is, since all feet in CY have the form (weak) strong, the phonetic strengthening occurs on the right margin of the foot.

4. Alutiiq

In the process of writing this final paper, I came to realize that a small alteration of the foot structure I had assumed for Alutiiq in "Prosody in Alutiiq" and "Evolution of Yupik Prosody," both in this volume, would put into perspective certain fundamental facts of Alutiiq prosody and its relationship with the rest of Alaskan Yupik. First, it has become increasingly apparent that, unlike the rest of Yupik, Alutiiq has three degrees of stress—zero stress, weak stress, and strong stress. This would seem to imply that within the Alutiiq foot there are two levels where branching may occur, as opposed to only one in CSY and CY (which have two degrees of stress).[4]

Let us first review the historical causes of this increased complexity. In CSY, only heavy syllables and stray word-final light syllables are defined as monosyllabic feet. In CY, however, under certain conditions light syllables may be defined as monosyllabic feet at any position within the word. This is a crucial difference between the two systems. I argue here that in Alutiiq, residual light syllables are not assigned each to its own foot as in CY, but remain unassigned at the foot level, and adjoin the foot to the left at a higher level, the **superfoot** level. The superfoot is left-headed, i.e. the foot is the strong node of the superfoot. For example, compare



'I will backpack it'

In the Koniag (KA) pronunciation of the above example, a single asterisk indicates weak stress, and a double asterisk indicates full (strong) stress. In the Chugach (CA) pronunciation, pitch as well as stress is predicted by the grid. A single asterisk indicates weak stress and low pitch; a double as-

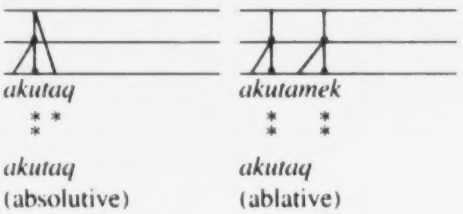
[3] Note also that the CY *e*-deletion rule has the effect of producing a branched rime. For example,

'my mouth'

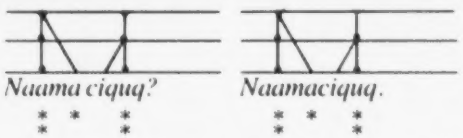
[4] This generalization is not true for most varieties of CY, where a phenomenon called "*ra*-deletion" has resulted in a third degree of stress (stronger than that of ordinary strong syllables). This is a marginal phenomenon, however, and not at all related to the question of three-level stress in Alutiiq. I will leave it to others to fit it into a more complete model of CY prosody.

terisk indicates full stress and high pitch and no asterisk indicates lack of stress and pitch intermediate between the neighboring syllables.[5]

Thus, those which until now I have been calling "unaccented feet" in Alutiiq are here reinterpreted as syllables joined to the "accented feet" to their left. As in CSY and CY, lengthening/gemination serves as a phonetic manifestation of the foot boundary. Now we may make the generalization that fortition is nothing more than the phonetic manifestation of the Alutiiq superfoot boundary. The two-level structure of the foot is reflected in the two phonetic processes that affect the boundary of each level: lengthening/gemination marking the foot level and fortition marking the superfoot level.

These two phonetic processes differ, however, in that lengthening/gemination operates at the right margin of the foot and marks the end of the foot, whereas fortition operates at the left margin of the superfoot and marks the start of a new superfoot. Both processes apply where superfoot boundaries coincide with foot boundaries, i.e. where no light syllable is appended to the foot. Compare, for example,

The syllable *ku* is lengthened in both cases, but *u* is longer in *akutaq* (where *t* is lenis) that in *akutamek* (where *t* is fortis, resulting in truncation of the syllable *ku*).[6]

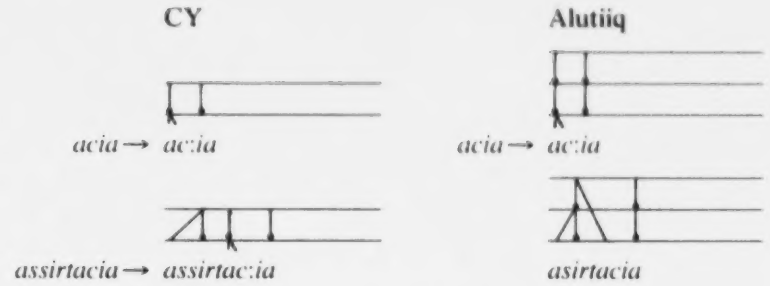
Furthermore, as I noted in section 1.3.1 of "Prosody in Alutiiq," the complex of articulatory characteristics of the superfoot-initial consonant which I call fortition, is phonetically indistinguishable from that of the word-initial consonant. This observation is supported by an example pointed out to me by Prince William Sound CA speakers, the homophonous pair



Besides providing a context for understanding the existence of three degrees of stress and foot-initial fortition in Alutiiq, the concept of the superfoot provides an explanation for another important difference between CY and Alutiiq. Whereas in CY open monosyllabic light feet are phonetically closed with the geminate of the following consonant, in Alutiiq this phenomenon does not occur with adjoined light syllables. Compare the following pair of words in CY and Alutiiq:

[5] The description of stress and pitch given here is somewhat idealized. I am not certain that there is any absolute difference in stress alone between "weakly stressed" and "unstressed" syllables in CA. Because stress and pitch level are commonly covariant in non-tonal languages it is often difficult, if not pointless, to try to dissociate stress from pitch level. Since "weakly stressed" syllables in CA have the lowest pitch level (level 1), they appear unstressed to the linguist-observer. Thus it is possible to argue that in CA we have two degrees of stress and three pitch levels, and that "weakly stressed" syllables differ from "unstressed" syllables not by stress, but in that the "weakly stressed" syllables are assigned pitch level 1, whereas the "unstressed" syllables are not assigned a pitch level of their own. Their pitch is dependent on the pitch of the neighboring syllables. See further section 1.4 of "Prosody in Alutiiq" and section 4.2 of this paper.

[6] Note, however, that *t* is not geminated and cannot be said to close the preceding syllable. See section 1.3.1 of "Prosody in Alutiiq" in this volume.



In Alutiiq the light syllable *ta* in *asirtacia* is not an independent foot as in CY, but is adjoined to the foot to its left. The prosodic motivation for gemination of the following consonant is therefore lacking in Alutiiq. In the case of *acia*, however, the syllable *a*, being word-initial, cannot be adjoined leftward. Thus, this syllable must remain a foot, and undergoes gemination as in CY.

Before beginning the discussion of the dialect-specific rules of Alutiiq prosody, I should mention destressing of final syllables. In Alutiiq, such destressing is optional, and as in CY, can be described by a minor rule that deletes asterisks below the final syllable on the metrical grid. Because this rule is minor and optional, it will not be further treated here.

4.1. Koniag Alutiiq

We are now prepared to sketch out the reformulation of the major Alutiiq prosody rules in metrical theory format. We will start with General Koniag Alutiiq (that is, all KA except the aberrant Katmai dialect):

A. Foot definition rules

1. **Word-initial monosyllabic foot rule.** If the first syllable in the word is light, then examine the first two syllables in the word (S_1S_2). In the following ordered cases, define S_1 as a monosyllabic foot:
   - **(a)** where S_1 is closed
   - **(b)** where S_2 is heavy: close S_1 with the geminate of the following consonant, so that S_1 is (C)VC and S_2 is :VV(C).
   - **(c)** S_2 is *Ce*: delete *e* and redefine S_1 as (C)VC. Otherwise form an iambic foot on S_1S_2.
2. **Heavy foot rule.** Define each heavy syllable as a monosyllabic foot.
3. **Three syllable rule.** Working from left to right, operating on non-initial sequences of three light syllables ($S_1S_2S_3$), where there is no enclitic boundary between S_2 and S_3, and S_3 is not voiceless[7], define S_2S_3 as an iambic foot if S_2S_3 is
   - **(a)** a disyllabic postbase
   - **(b)** contained within the final "accent-advancing" portion of the word.[8]
4. **Two syllable rule.** Define each remaining pair of unassigned (light) syllables (S_1S_2) as an iambic pair, except where S_2 is voiceless.

[7] The term "voiceless" here is elliptical; the full description is "containing voiceless or quiescent *e*." See section 4.3.2 of "Prosody in Alutiiq" in this volume for a description of quiescent *e*.

[8] These two conditions are not fully stated, having been more fully detailed in "Prosody in Alutiiq." For A3a see section 4.2 and for A3b see section 4.1. Under A3b we should probably also include the case where a stem ending in *Ce-* followed by a monosyllabic postbase comprises S_2S_3; see 4.3.1. In Perryville KA, rule A3 has a slightly different form, which we can express by adding the following condition: (c) a voiceless syllable (S_3) followed by a syllable contained within the final accent-advancing portion of the word (S_4). This will not be illustrated here.

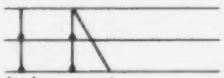
On the metrical grid, asterisk strong node of each foot.

B. **Superfoot formation rule:** Form a left-headed superfoot on each foot plus any unassigned (light) syllables immediately following the foot. *

On the metrical grid, asterisk all voiced nodes of the superfoot.

Comparing these rules with the CY rules given above, we can see a certain parallelism in the relationship of CY rule 1b and KA rule 3, on the one hand, and CY rule 2a and KA rule 4 on the other. In both languages a rule defining iambic feet in a restricted environment is followed by a rule defining iambic feet in residual cases. I will exemplify first rule A:

A1a.



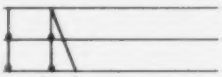
kakngaani

* * *
* *

'at the top of it'

aciani → *ac:iani*

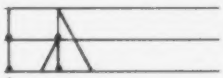
A1b.



* * *
* *

'under it'

A1c.



itequtartuq → *itqutartuq*

* * *
* *

'he's going to enter'

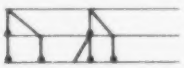
A2.

taiciiqaa

* * *
* * *

'she will bring it'

* In KA we can propose an alternative structure for the superfoot. Rather than adjoin unassigned light syllables directly to the preceding foot, we can add a rule (A5) which assigns each of these stray syllables to its own foot, and then modify rule B so that these non-initial monosyllabic light feet are attached to the feet to their left. Thus we obtain



atmageiqaqa

: * : *

rather than

atmageiqaqa

: * : *

'I will backpack it'

This treatment has two advantages: (a) the superfoot is formed by attaching feet (not syllables) to feet; and (b) the number of asterisks on the grid corresponds with the number of strong nodes.

However, this treatment does not work for CA, where rule A3b produces monosyllabic light feet which are not attached to the preceding foot. These true monosyllabic light feet would be indistinguishable from the feet created from stray syllables by rule A5 above, and hence would be incorrectly left-adjoined by rule B.

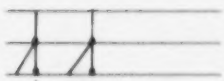
A3.

aciwartuten

* * *
* *

'you're going down'

A4.



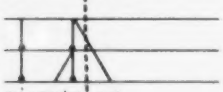
aciwartuq

* *
* *

'he's going down'

Rule A3, motivated by the morphological structure of the word, is perhaps the most unusual and interesting rule in Yupik prosody. In the following examples, the morphological structure of the word is roughly labeled:

Stem | **Infl.**

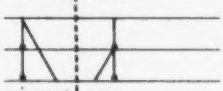


piqruta | *qa*

* * *
* *

'my bat'

Stem | **Infl.**



piqrut | *aqa*

* * *
* *

'I'm hitting it against something'

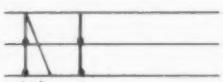
Stem | **PB**[*] | **Infl.**

piqru | *hnaya'* | *aqa*

* * * *
* * *

'I could hit it against something'

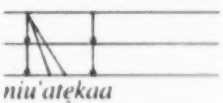
Note that in a sequence of two or three light syllables, either A3 or A4 must apply to form a foot on S_2S_3 or S_1S_2 *unless* the final syllable of this foot is voiceless. In this case, the "window" of the rule moves rightward, until a sequence of light syllables to which the rule will apply is found or the rule fails. An important corollary of these rules is that the maximum number of **voiced** light syllables that can be appended to a foot to form a superfoot is one. If the superfoot contains more than one appended syllable, all but possibly the first of these syllables must be voiceless, as the following examples illustrate:



niu'ataa

* * *
* *

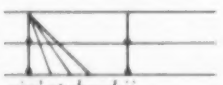
'she's talking with him'



niu'atḷekaa

* *
* *

'she's talking about him'



niu'atḷekḷegkii

* * *
* *

'she talked about him'

[*] The postbase *+navar-* (like *+ciqe-* 'future' in *niu'atekeŋqaqa* below) directly precedes inflectional endings and thus belongs to the final portion of the word, but since it is a disyllabic postbase, subrule A3a applies here.

'I'm talking with him' 'I'm talking about him' 'I will talk about him'

Thus rules A3 and A4 have the effect of preventing most voiceless syllables from being defined as the strong node of a foot.[11]

4.2. Chugach Alutiiq

The main rules of Chugach Alutiiq (CA) prosody can be stated as follows (two additional minor rules are discussed below):

A. **Foot formation rules:**
1 and 2 as in KA.

3. **Three syllable rule.** Working from left to right, operating on non-initial sequences of three light syllables ($S_1S_2S_3$), where there is no enclitic boundary between S_2 and S_3:
   (a) define S_2S_3 as an iambic foot unless S_3 is voiceless.[12]
   (b) define S_2 as a monosyllabic foot where S_3 is voiceless, and resume left-to-right scanning following S_2 (i.e. beginning with the voiceless syllable).

4. **Two syllable rule.** Define each remaining pair of unassigned (light) syllables (S_1S_2) as an iambic foot.

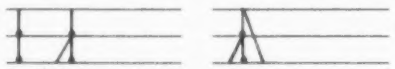
On the metrical grid, asterisk strong nodes.

B. **Superfoot formation rule.** Form a left-headed superfoot on each foot plus an unassigned (light) syllable, if any, immediately following the foot.

On the metrical grid, asterisk the voiced node(s) of each superfoot (both strong and weak nodes).

C. **Pitch group formation rule.** From left to right, operating on pairs of superfeet (SF_1SF_2), form right-headed pitch group on each pair if SF_1 is identical with the foot it dominates (i.e. where there is no weak syllable appended to the foot).

[11] It is not possible to avoid marking voiceless syllables as strong when the foot to which they are assigned is the first in the word, so that there is no leftward foot to which S_1S_2 can be adjoined:



kęglluku 'biting it' *qikęrtaq* 'island'

This observation is true of CA as well as of KA.

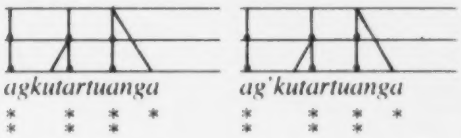
[12] See note 7.

On the metrical grid, asterisk the strong node of each pitch group.

Note that rule C, which forms what I call pitch groups, is confined to CA. Since this adds a new layer of prosodic organization, we will first look at the foot and superfoot formation rules and how they differ from those of KA, ignoring for the moment the pitch group formation rule.

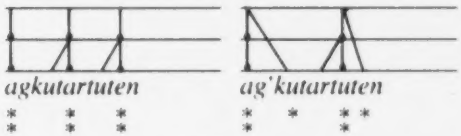
Rules 3 and 4 in CA are somewhat simpler and more general than those of KA. There is no morphological conditioning in the CA variant of rule 4 as there is in the KA variant. Compare the treatment of *-kutar-* 'be going to V' in the following examples:

KA **CA**



agkutartuanga *ag'kutartuanga*

'I'm going to go'

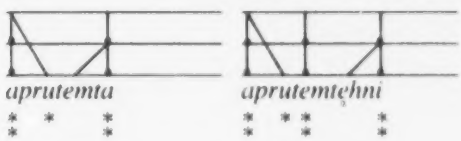


agkutartuten *ag'kutartuten*

'you're going to go'

Rule A3b in CA has the same effect as the voicing conditions of rules A3and A4 in KA—avoiding stressed voiceless syllables. In CA, however, this effect is achieved in an entirely different way:

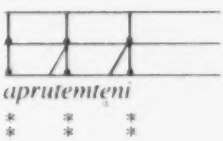
A3a. **A3b.**



aprutemta *aprutemtęhni*

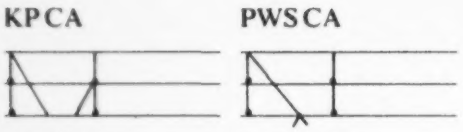
'of our road' 'in our road'

compare **KA**



aprutemteni

In PWS CA we must furthermore modify rule A3a to take care of the special case where the onset of S_2 is $\emptyset$ (i.e. S_2 is vowel-initial). In "Prosody in Alutiiq" in this volume, I handled this case with a rule which contracts S_1S_2 to a single "unaccented heavy" syllable (see post-FD rule 5 under sec. 2.2.2.3). In metrical theory, this could be represented by the PWS CA structure given below.



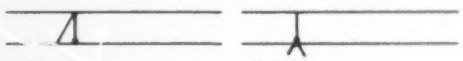
atma'aqa *atma'aqa*
'I'm backpacking it'

but perhaps it would seem more natural to leave the syllable structure as is and append *both* syllables to the preceding core, as follows:

atma'aqa

The phonetic evidence does not clearly favor either analysis (see also note 15 of "Prosody in Alutiiq").

We also need a rule which accounts for the CA contraction

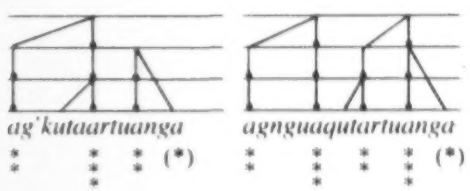


(C)V.V(C). → (C)VV(C)

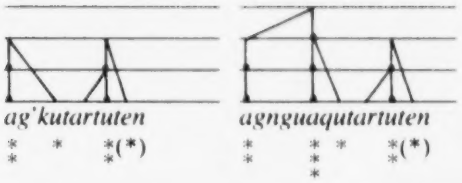
See post-FD rule 4 under section 2.2.2.3 of the Alutiiq paper for the particulars of this rule. Note also that these two minor rules are unique in that they require inspection of the syllable onset. All the other Yupik prosodic rules are concerned only with rimes.

Rule C, which forms pitch groups from adjacent pairs of superfeet, is of special interest because it is peculiar to CA, and because it predicts pitch level rather than stress. The number of asterisks on the metrical grid after the operation of this rule predicts both stress and pitch as follows: no asterisk indicates no stress, and pitch is intermediate between the neighboring syllables; one asterisk indicates weak stress and low pitch (level 1); two asterisks indicate strong stress and mid-high pitch (level 2); and three asterisks indicate strong stress and high pitch (level 3).

Note that pitch groups are structurally similar to iambic feet—they are bounded and right-headed, and are assigned by examining pairs of superfeet, proceeding from left to right through the word. Since more than one pitch group may occur in a word, this level of prosodic organization is intermediate between the superfoot level and the word tree level (the latter, however, is absent in CA). The following examples from section 1.4 of "Prosody in Alutiiq" show how pitch groups can be represented.



ag'kutaartuanga *agnguaqutartuanga*
'I'm going to go' 'I'm going to dance'

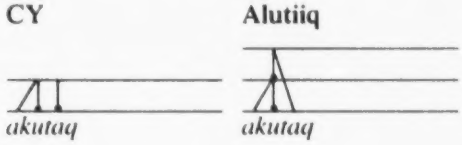


'you're going to go' 'you're going to dance'

5. Retrospect on fortition

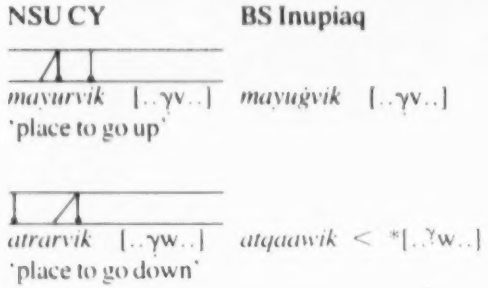
In retrospect, it seems to me that "fortition" may be too strong a name for the phenomenon associated with the superfoot boundary in Alutiiq. By speaking of "fortis" and "lenis" variants of consonants, I have perhaps conveyed the impression that these variants are always clearly distinguishable. This is not the case—distinctiveness depends on the type of consonant, the weight of the syllable it heads, the closure of the preceding syllable, and the dialect or variety of the speaker. In short, this variation is not clear-cut enough to be treated as allophony, but is a more subtle phenomenon (although in CA and particularly PWS CA we might say it approaches allophonic status). Looked at in this way—as a non-contrastive manifestation of foot boundary—we can readily see that this phenomenon has existed and continues to exist in at least some of the rest of Alaskan Yupik.

For example, I have noticed what sounds very much like Alutiiq fortition of foot-initial stops in the speech of some GCY speakers; in careful pronunciation of *akutaq*, foot-initial *t* sounds noticeably "fortis" in comparison with foot-internal *k*, and in comparison with the Alutiiq pronunciation, where both *k* and *t* are superfoot-internal and thus lenis.

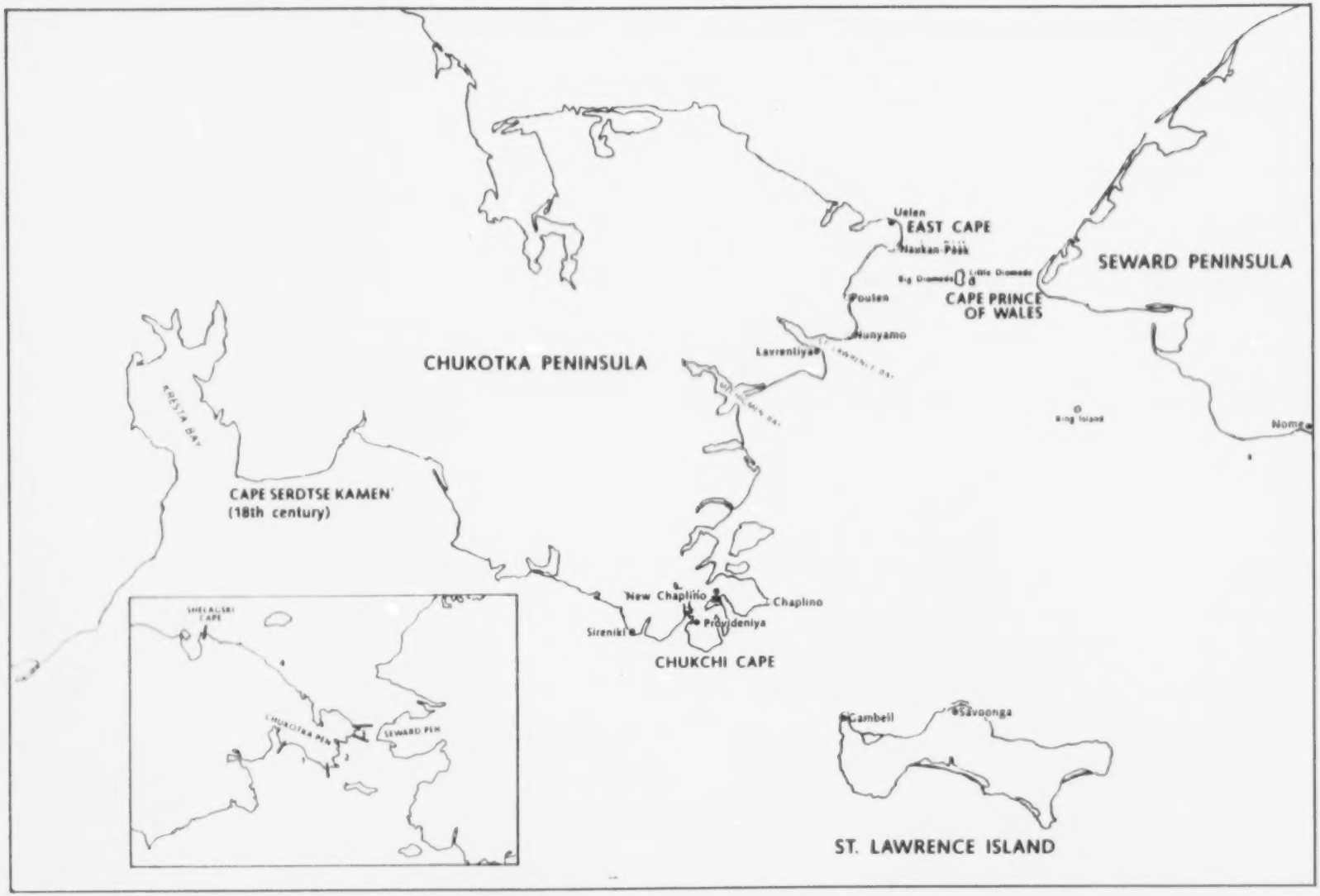


Thus, in both the northern and southern varieties of AY, fortition is associated with a prosodic boundary: in CY, the foot; and in Alutiiq, the superfoot.

Norton Sound-Unaliq (NSU) CY and Bering Strait (BS) Inupiaq exhibit consonant variation attributable (only partially in NSU CY) to precisely this same phenomenon. In NSU CY the variation described by Jacobson (this volume, section 3.3) involves only voiced fricatives. These are more approximate syllable-finally, where geminated, and heading a heavy syllable, but less approximate elsewhere after an open syllable. What is of interest here, however, is that after a closed syllable and heading a light syllable, they are more approximate foot-initially but less approximate foot-internally, i.e. beginning the strong syllable of an iambic foot. Likewise, in BS Inupiaq lenition affects consonants contiguous to the internal syllable boundary of an iambic foot. The following examples illustrates the comparability of these phenomena:



In sum, while it seems more appropriate to speak of "fortition" in Alutiiq versus "lenition" in BS Inupiaq, we may perceive a single historical cause underlying both phenomena—the tendency in AY toward stronger articulation of consonants at the foot or superfoot boundary and weaker articulation at the syllable boundaries within the foot or superfoot. Statistically, then, these "lenis" consonants tend to predominate in Alutiiq more than in CY, and it seems most natural to consider the "fortis" consonants to be the marked variety in Alutiiq.



Map 2. Locations referred to for Asiatic Eskimo, with inset illustrating distribution of Asiatic Eskimo languages in 1791, according to Merck. 1 = Sireniksi, 2 = Chaplinski, 3 = Naukanski, 4 = Uelenski.

SIRENIKSKI AND NAUKANSKI

Michael Krauss

1. Introduction

I shall here attempt to describe the prosodic features of Sirenikski and Naukanski, two of the three Asiatic Eskimo languages, the third being Central Siberian Yupik (CSY)—i.e. Chaplinski and St. Lawrence Island—as defined in the introduction to this volume. Other than being both non-Inupiaq, and being on the Asiatic mainland in contact with Chukchi, these two Eskimo languages do not have as much in common linguistically as might be expected. This is especially true for prosody, as we shall see. However, for our purposes, Sirenikski and Naukanski have much in common in another sense. They are by far the least accessible to us, both in the inaccessibility of the speakers to Western linguists, and in that these two are the most recently and least amply documented of all the Eskimo-Aleut languages. In both cases we are dependent mainly on monographs by Menovshchikov (1964 for Sirenikski and 1975 for Naukanski[1]), the only major documentation presently available to us. From these it is an essentially philological task to infer the prosodic facts. We are deeply indebted to Professor Menovshchikov for providing the world of Eskimo linguistic science with these published major sources of information.

Sirenikski and Naukanski were first identified as such, distinct from Chaplinski,[2] in 1895 by N.L. Gondatti, who collected valuable parallel wordlists for Naukanski, Chaplinski, and Sirenikski (the first wordlist ever for Sirenikski). These were published with discussion and comparative analysis in 1897 by V.F. Miller. In 1901 V.G. Bogoraz supplemented this with interlinear Sirenikski and Naukanski translations of two short Chaplinski texts (published 1909:187-190 and 1949:176-178), the first texts in these languages.

Gondatti-Miller and Bogoraz both recognized Sirenikski and Naukanski as distinct from Chaplinski, but they evaluated the divergences very differently. Gondatti-Miller claimed both were mutually unintelligible with CSY, especially Sirenikski, and that speakers resorted to Chukchi to communicate between the groups. Bogoraz, on the other hand, claimed that both Sirenikski and Naukanski were mutually intelligible with CSY. Gondatti-Miller were, in our view, much closer to the truth, especially in the case of Sirenikski (very explicitly verified also by Menovshchikov 1964: 6-7). Naukanski is in fact linguistically much closer to Chaplinski than Sirenikski is, but in modern times, geographically the reverse has held. Until the nineteenth century, Naukanski and Chaplinski may have been close neighbors, Chaplinski being spoken along much of the Beringian coast of Chukotka, including Mechigmen and St. Lawrence bays, with Naukanski starting just north of that, at Pouten (see Titova 1978:99-100, Chlenov and Krupnik 1983:129ff.), at an abrupt border only 30 miles south of East Cape. In any case, however, for more than a century now, Chaplinski and Naukanski have been separated by most of the Beringian coast of Chukotka and by speakers of Chukchi. Sirenikski, on the other hand, has been in immediate and intimate contact with Chaplinski at

[1] For references throughout, see list at the end of this volume.

[2] For a discussion of a much earlier statement on Asiatic Eskimo languages (Merck 1791) see section 3.4.

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all times during the historic period, so much so that by the turn of the century, at the time of Gondatti-Miller and Bogoraz, the intelligibility of CSY to Sirenikski was probably quite untestable already. By 1900 most or all Sirenikski speakers must have been at least passively competent in Chaplinski, perhaps many or most also actively so. One generation later, they must have been abandoning their old Sirenikski language in favor of Chaplinski, given the fact that there have been few or no fluent speakers of old Sirenikski who were born after about 1925. (See Menovshchikov 1964:4-9; also Krupnik and Chlenov 1977:22, 25-26, an excellent article generally, for the linguistic situation in Chukotka 1790-1970.) It is extremely important to consider this diglossic Eskimo situation (not to mention also the use of Chukchi, Russian and even English, in early twentieth-century Chukotka) in any attempt to understand the phonological development of the documented Sirenikski language. This has resulted in dramatic convergence (i.e. assimilation of Sirenikski toward Chaplinski) in addition to outright replacement of Sirenikski by Chaplinski. Aside from the fact that there were in 1980 (personal communication, I. Krupnik) only two elderly women still alive who had some active ability to speak Sirenikski, what has been left of Sirenikski itself since the beginning of its documentation in 1895 has been so heavily influenced (phonologically and lexically, at least) by Chaplinski, that the two languages have certainly come much closer to mutual intelligibility than they had been in the past. In fact, given the bilingual competence of Sirenikski speakers, practically the only forms which can be trusted to be historically Sirenikski are those which are different from the Chaplinski. Given, for example, Sirenikski *asa* for 'land' (all other Eskimo *nuna*), one can be certain of the historicity of the Sirenikski form (<**aci* ?), but conversely, given *qilə*χ^{1} for 'sky' (Chaplinski *qilak*), one cannot be certain that this is not a recent diffusion, which the Sirenikski speakers have processed through their sense of the correspondences (final fricatives for stops, reduction to ə of vowels in non-initial syllables), a sense which must certainly have been a part of their bilingual competence. In this case, one could probably also elicit *qilax*, since the bilingual Sirenikski speakers would be capable of restoring any of the reduced vowels from their knowledge of Chaplinski, whether the form was historically Sirenikski or not. We shall return to such considerations below.

Naukanski, on the other hand, though genetically much closer to Chaplinski, and therefore with much more natural potential for mutual intelligibility (no doubt realized in the past when Naukanski and Chaplinski were neighbors), must have had relatively little contact and cultivation of this potential during the later nineteenth century and early twentieth century, until Soviet administration in the 1930s established a standard literary Eskimo language in the schools, including the Naukan school, on the basis of Chaplinski language, and in 1958 physically relocated the Naukan population. Historically and until Soviet times, Naukan had in fact been in closest contact not with Chaplinski or Yupik at all, but instead with the Inupiaq of the Diomedes and Seward Peninsula, Alaska.

I shall now consider the prosody of Sirenikski and Naukanski individually.

2. Sirenikski

After Gondatti-Miller and Bogoraz, the first likely documentation of Sirenikski I am aware of was by Aleksandr S. Forshteyn, a pupil of Bogoraz. Forshteyn evidently spent 1927-1934 with the Asiatic Eskimos, and gathered a significant Sirenikski corpus: "The Eskimo language is slowly dying out and after the lapse of another decade all research will be impossible, at least as regards several dialects. Personally, I possess sufficient material for the making of a dictionary containing two Asiatic Eskimo dialects."[4] Perhaps this material may still be locatable in the Soviet Union. From the description, one of the dialects referred to must have been the rapidly declining Sirenikski.

[1] In this paper, for the fourth vowel, I use both ə and *i*, the latter particularly in the transliteration or discussion of Soviet data, but note that the two symbols are equivalent for our purposes. Transliteration of Soviet transcriptions and the representation of the St. Lawrence Island and Alaskan Yupik forms are here coordinated for comparability, especially by using phonetic symbols, e.g. γ and ŋ, instead of the orthographic ones.

[4] According to a letter from Forshteyn to Franz Boas, June 30, 1936; Boas correspondence, American Philosophical Society.

In 1940-41 E.S. Rubtsova transcribed an important corpus of 48 Sirenikski texts. These are still unpublished. We have received through an exchange with the Soviet Academy of Sciences a typescript copy of these texts. It is a very valuable document, but lacks the original accent marks, so that it cannot be fully used for the present purposes.

G.A. Menovshchikov taught school in Sireniki during 1932-34. By that time the dominant (or more probably, exclusive) Eskimo language of the school children must have been Chaplinski. Menovshchikov, in any case, began his research on old Sirenikski only much later, in 1948 (with further fieldwork in 1954-55 and 1960-61). He published a preliminary but very interesting article on it (1962), and then a major monograph (1964). He has also published some Sirenikski data in comparative articles and major works, both before (as early as 1949:571) and since.

N.M. Emel'yanova, since the 1960s, has carried out a great deal of lexical fieldwork on all Soviet Eskimo languages, including Sirenikski, extending the lexical documentation of Sirenikski far beyond the 2,000 or so forms listed in Menovshchikov's lexicon (1964:177-203).

Though these important materials remain unpublished (Emel'yanova's lexical files, Rubtsova's texts, and perhaps Forshteyn's lexicon, if that can be located), we may at least feel some reassurance that the Sirenikski language is documented far more extensively than in the major source presently available to us, Menovshchikov's very valuable monograph of 1964.

2.1 Sirenikski alternate stress—deuterotonic and prototonic

To give one an idea of the divergence of Sirenikski, the prosody will do as well as any other aspect of the language. In fact, it turns out that the prosody epitomizes the position of Sirenikski, both in divergence and, we now see, also convergence. Judging from the data in Menovshchikov (1964), clearly the usual pattern for stress placement in polysyllabic words is on the second syllable, even if the first syllable is closed and/or the vowel of the second syllable is *i*, *e.g. uyíqix* 'neck' (CSY *uyáquq*), *aŋyí·ya* 'his boat', and confirming Rubtsova (1954:16), the stress then quite regularly falls on alternate syllables whether open or closed, as in, for example, (Text 1.2) *kipítxináqaγítimíŋ tamí·yitúxtiqíli·γáy*, (1.6) *uxpíxsimíki·ŋiy*, (1.10) *axtíxtiqíli·γay*, (1.17) *qavínixsí·yimíkiŋíy*. To show the stress, Menovshchikov sometimes writes macron, sometimes acute accent, sometimes both, as often and as freely on *i* as on other vowels. These marks are so consistently used on alternate syllables, but otherwise so randomly chosen, that it seems that there must be very clear alternate syllable stress, whereas length distinctions, if any, are far less clear. Rubtsova, in her remarkable statement (1954:16) on stress, including Sirenikski ("In the Sirenikski dialect, in which it was not possible to distinguish long vowels, stress in all cases regularly occurs on every other syllable"), certainly supports both these claims.

It is of course crucial that the alternate stress is not perturbed by the presence of full vowels (potentially from older long vowels, as opposed to reduced *i*) in the sequence. It is also important that in Menovshchikov's phonetic markings for stress *i* is written with macron (or macron and acute accent), as often and as freely as the other vowels in similar environments are, as a further indication that *i* has the same prosodic status as the other vowels, and that the only difference between *i*, *a*, *u*, and *i* is in timbre.

Menovshchikov has on several occasions published statements recognizing the principle of alternate syllable stress (for Chaplinski, 1960:52, 1962:47 n. [explicitly from Rubtsova 1954:16], 1968: 368; for Naukanski, 1975:32; and for Sirenikski, 1964:107). Accordingly, accent marks (´, ¯, and ˘, without clear distinction or predictability) are to be found with significant regularity on every other syllable in Menovshchikov's transcriptions of Sirenikski. The one frequent and significant type of exception to this regularity is the final syllable, which, unlike that of CSY, is often stressed when the penult is not, and often is not stressed when the penult is not, but also sometimes is stressed even when the penult is also stressed, e.g. *tasíminiŋ* (Text 1.3), *tasíminiŋíniŋ* (1.1), *tamí·γγaγútiy* (1.9). This sudden inconsistency in notation of stress on final syllables no doubt corresponds to some phonetic reality, possibly reflecting some discourse-level prosodic feature. (In this respect Sirenikski

prosody is evidently quite different from that of CSY, at least as spoken on St. Lawrence Island, where a final syllable is consistently without stress. See "Supplementary Notes on Central Siberian Yupik Prosody" in this volume.) At the same time it seems to verify by contrast the regular pattern of alternation on word-internal syllables.

In addition to the usual alternating stress pattern, with stress on the even-numbered syllables, which we may call the dominant deuterotonic pattern, there is another pattern: in both the texts and vocabulary Menovshchikov (1964) shows a small but definite proportion of polysyllabic words with stress (´, ¯, or ˝) on the initial syllable, and alternate stress then on the odd-numbered syllables of the word, clearly confirming the stress on the initial syllable, a pattern which we shall call prototonic. In this category we may count with confidence only polysyllables.[5]

One source of such prototonic polysyllables is loans from Chukchi, for example *kīminyér²a* 'hollow of hand', *ínikámlilá* 'scarf', *ápayípèyíγayím* 'spider (rel.)' (cf. CSY *apáyipáyiiq*); or loans from English, e.g. *ívínrúta* 'outboard motor' (< *Evinrude*, cf. CSY *ivínrun*). Another source, however, is native, often corresponding to bases with lengthened initial syllable in CSY, as *táqìsqíxtiγá* 'finish (tr.)', CSY *taaqaqaa; kámìxtíqìxtíγá* 'put boots on (tr.)', CSY *kaamγaqaa*, from *kamik* 'boot'. Sometimes there is alternation or fluctuation, e.g. *ītìxtíqìxtíx* 'enters', *ìtìxtìtíqìxtíγa* 'brings in' (CSY *itiγ-, iitxa-, itxuti-*); *kātìqíxtix* 'arrives', *kātatíqìxtíγa* 'reaches' (CSY *kaati-*), but cf. the fluctuation Text 11.113 *kałímì*, 11.126 *kāłímì*, 11.192 *kałímiŋ*, 6.42 *kāłíku*, 1.7 *kāsímílíγay*, 11.90 *kasímilíγix*. However, there are also some instances with lengthened or stressed initial syllable in Sirenikski corresponding to CSY forms with short initial syllable, and full vowel in second syllable, thus no known source for lengthening or stress, e.g. *úkìqáxtìqíxtíγá* 'pierces', CSY *ukíquxtáγaqaa; íγìyúxtìqíxtix, íγìyúkìsqíxtíγá* 'thanks', CSY *iγámsiqá-; āŋèyíqatíłíγay* 'rivalry', *āŋèykícałix* 'enmity', CSY *aŋúyakútiłiq;* and, with fluctuation, 2.6 *pāŋèlíłímì*, 2.3 *paŋélaxqísìłíγix*, CSY *paŋal(i)γ-* 'run'.

Some of the Sirenikski disyllables with lengthened first syllable might conceivably be distinctively so, for example 2.27, 2.31 *pāpka* 'my tail' (CSY *paapka*, from *papik* 'tail'); 2.30 *tāwá* 'here (*vot*)', *tānā* 'that one' (CSY *taawa, taana*).

Whatever the source—loan, double vowel, lengthened vowel (lexicalized or not)—there is clearly a category of Sirenikski words with initial (hence odd-syllable) length or stress. However, in the polysyllables (perhaps also in disyllables), the most likely explanation for the prototony—especially considering the agreement with the lengthened first syllables in Chaplinski, together with the clear and frequent cases of fluctuation, and the cases of outright disagreement—must be a simple diffusion of the Chaplinski prosodic pattern itself. That pattern is basically deuterotonic, but with a certain proportion of prototonic forms with long or lengthened first syllable, which have influenced the performance of the Sirenikski speakers, most frequently in the appropriate cognate forms, but with frequent fluctuation, and also with some extension to inappropriate forms (or, as we shall see below, since we claim that Sirenikski was previously strongly prototonic itself, the prototony here which does not correspond to the Chaplinski may be a retention for Sirenikski as much as an innovation). If indeed any of the prototonic forms remain so because of some historical marking, that must have been by some feature other than stress, conceivably length or some other autonomous but otherwise unattested feature.[6]

As mentioned above, *i* evidently now has the same prosodic status as the *a, i, u* in Sirenikski; polysyllables with prototonic *i* are somewhat rare, perhaps expectably, but do occur, even though

[5] In disyllables, stress or macron is not necessarily significant (as detailed in my article of supplementary notes on CSY prosody in this volume): e.g. Sirenikski *ānix* 'excrement', *panix* 'daughter', *sítix* 'claw'; cf. CSY *anaq, panik, istuk*; see also note 6.

[6] As the only other ready explanation, we must consider the possibility that Sirenikski is here reflecting some Proto-Eskimo segment or feature not reflected in any other Eskimo language (as it does in other respects—for example, certain intervocalic consonants, see below); conceivably thus, e.g., **pa²ŋaliγ-, *a²ŋavaγ-*, and, in case the prosodic transcription of disyllables like *ānix* and *panix* corresponds to any historical reality, **a²naq* but **panik*. The symbol ² here, a graphic variant of ʔ, is used merely as an abstraction !

i in the first syllable can only be the historical reflex of *i* itself, not of any vowel that can be lengthened. A full list from the 1964:177-203 vocabulary follows. The sources are loans, presumably Chukchi, e.g. *wíʔɨlá* 'melting snow', *wɨniqun* 'please', *kīminyírʔa* 'hollow of hand', or native forms with *i* as the vowel of both first and second syllables, as *ɣɨmɨtálɨɣɨx* 'good-for-nothing' (cf. CSY *iɣmiɣ-* 'not tarry'), *īmiɣcɨkiɣlɨɣɨx* (also transcribed ə̄м-) 'sonorous' (cf. CSY *mi-* 'voice, sound', CAY *imaiɣ-* 'quiet'), *tīɣɨláɣricɨqɨxtɨx* 'seizes' (cf. *tiɣlíniɣtɨɣɨx* 'thief', CSY, CAY *tiɣlɨɣ-* 'steal'), with various types of metathesis, insertion, and/or deletion of *i* (and/or of accent).

Menovshchikov, in noting in the introduction to his Sirenikski texts (1964:107) the general pattern of stress in alternate syllables, also notes inconsistencies in the stress as he has it transcribed, and attributes these to stylistic or discourse-level factors in text and in the difference between connected text and isolated words. It is not clear, however, whether he is referring to inconsistency in stress placement or in stress mark type (´, ¯, or ˘), or both. Bergsland, in his very interesting review (1966:141) of the monograph, also notes the inconsistencies in Menovshchikov's representation of stress, and in connection with alternations such as *mámmɨx* 'milk' and *maméxtɨqɨxtɨx* 'suckles', remarks, perhaps incredulously, that here vowel quantity apparently depends on stress, as in Russian, rather than the reverse, as in all or most other Eskimo, where quantity (rather than stress) is the crucial distinction. In any case, it does not seem to be an important or easily answerable question whether the prototonic Sirenikski forms are synchronically marked by stress or by distinctive length on the vowel of the first syllable (with a subsequent rule assigning alternating stress to the first and odd-numbered syllables). All that is needed to represent distinctive word-level prosody in modern Sirenikski is a mark for length and/or stress when it occurs on the first syllable. The main question in this respect is only which bases, if any, are consistently so marked. Since the real variability in the memory of Sirenikski speakers in this matter (as well as others) has never been investigated as such, this question may have to remain unanswered.

There is another prosodic property of the initial syllable in Sirenikski, an extremely important one, which will become very clear as we look more closely at the basic phonological correspondences between Sirenikski and the rest of Yupik, particularly the reduction of vowels to *i* in non-initial syllables. Ths reduction will reveal that Sirenikski, beneath its most modern prosodic surface, is profoundly different from other Yupik in its prosody.

2.2 Old Sirenikski prototony and word-internal vowel reduction

From some of the preceding items, as Sirenikski *uyɨqɨx* 'neck' (other Yupik *uyáquq*), or Sirenikski *ivɨla* 'sinew' (underlying *ivɨli*, with the rule *i* → *a*/__# as in CSY and Alaskan Yupik; other Eskimo *ivalu*), Sirenikski *ɨiɣɨta* (CSY *siɣúta*, Alaskan *ciun* 'ear'), *aɣvɨqɨx* (CSY *aɣvíqaq* 'strait'), it is clear that Sirenikski has *i* instead of *a i u* in all syllables except initial, by some process of reduction. These obvious correspondences were noted already by Miller in 1897:141-42; by Menovshchikov in 1959:311, 1962a:42-43, 1962b:110-111, 1964:14-16, and Elmegård Rasmussen 1979:103. (There are abundant counterexamples to this reduction, but here it is sufficient to say that any of these vowels can be reduced to *i* in non-initial syllables. I shall attempt to explain the counterexamples later.) It is also clear that while the process of reduction of *a, i,* or *u* to *i* may take place in any or all non-initial syllables of a Sirenikski word, the reduction does **not** take place in the initial syllable. While it is common in the world's languages for reduction and neutralization of *a, i, u* to *i* to take place in unstressed syllables, it is certainly far less common in stressed syllables; that reduction should take place in any language in stressed syllables while not in unstressed syllables must be improbable indeed. Therefore, it follows that in Sirenikski it is extremely improbable that stress of e.g. *ivalu* can always have been on the second syllable (where it is in Sirenikski [ivɨla] now, and where it is in all other Yupik [ivá·lu]). For the vowels of the second and third syllables to be reduced, but not the first, the stress must certainly at one time in Sirenikski have been regularly on the initial syllable instead, thus **ívalu* → **ívɨli*; subsequently, by two more recent steps, in either order, *ivɨla* obviously by diffusion from the dominant Chaplinski deuterotonic pattern. The Sirenikski vowel-re-

duction pattern is convincing evidence of an earlier purely prototonic state for Sirenikski, and one moreover with no alternating stress in the following odd-numbered syllables, as there is no trace of vowel-reduction pattern in alternating syllables, as far as I can see. This basic simple prototonic pattern in Sirenikski is thus in sharp conflict with the clearly documented pattern of Central Siberian Yupik, Central Alaskan Yupik, and Pacific Yupik, all of which share basic deuterotonic alternating stress, thus presumably Proto-Yupik *CVCV́CVCV́CV, but old Sirenikski *CV́CVCVCVCV. If Sirenikski shared the Proto-Yupik pattern, it must have lost it before any of the phenomena consequent to it that occurred in the rest of Yupik took place. It is thus much easier to consider Sirenikski separate from Yupik or the rest of Yupik in this respect at least. In any case, its present prosody must be a relatively superficial and recent acquisition by diffusion from Chaplinski, and just one respect of many in which Sirenikski is literally being overwhelmed by Chaplinski.

Moreover, in the Gondatti Sirenik wordlist from 1895, published by Miller (1897), there seems to be direct evidence that at that time Sirenikski stress was still in a state of transition, that the process of adoption of the dominant deuterotony had not progressed as far as it had by 1948. Gondatti-Miller records accent (one per word) in each of the four languages it lists: Chukchi, Sirenikski, Chaplinski, Naukanski. Along with the many Sirenikski accents that agree with the Chaplinski (e.g. *čiɣ́itika* '(my) ear', *sakɨ́ka* '(my) sister-in-law' (CSY *siɣútika*, *sakíka*)), there are a fair number, perhaps equally many, with accent on initial syllable still in 1895, e.g. *sákɨka* '(my) father-in-law, mother-in-law' (clearly the same item as the preceding), *íɣɨka* '(my) leg' (CSY *iɣúka*), *ánɨ́ɣa* 'snow' (1964 *anɨ́ɣa*, CSY *anɨ́ɣu*). It is thus perhaps not long ago at all that Sirenikski began to acquire the Chaplinski stress pattern.

Another remarkable phonological trait of Sirenikski is the retention of intervocalic consonants lost in all other Yupik. Central Siberian Yupik generally tends to be more conservative of such consonants than Alaskan, as, for example, *siɣuta* 'ear', Alaskan *ciun*, but Sirenikski is far more conservative still; in fact it often preserves an intervocalic consonant lost in all other Eskimo, e.g. *atɨ́ɣɨsɨ̣x* 'one' (CSY *ataasiq*, Alaskan Yupik *atauciq*, Inuit *atausiq*), Sirenikski *acɨ.x* 'blood' (CSY *aak*", other Eskimo generally *auk*, thus Proto-Eskimo **aẓuk*; also with the expected reduction $u > i$ in Sirenikski). Unless Sirenikski was at one point inserting sonorant consonants to break up vowel clusters (certainly a possibility for both Sirenikski and corresponding Inuit retroflexes, cf. some English *saw it* → *saw-r-it*), it also casts doubt on the status of vowel clusters or double vowels in Proto-Eskimo, which thus may have had syllables only of the shape $\overset{\#}{C}$V(C) (as envisioned by Bergsland already in 1959:8-10), and no long vowels or vowel clusters except presumably at morpheme junctures. Thus Sirenikski, or what we may call hypothetical "pure Sirenikski" presumably had no source for vowel length contrasts, at least stem- or morpheme-internally.

Now, as mentioned above, Sirenikski does have abundant instances of *i a u*, non-reduced, in non-initial syllables.[7] For these, there are doubtless several sources. One, of course, is loans, as e.g. *lālālá* 'dew', *ɨntáqun 'a nu zhe'*, etc., from Chukchi, or *rayísa* 'rice', *'ívinrúta*, from English. Another is by obvious late phonetic rule, e.g. $ɨ \rightarrow a / __\#$; or as in previous examples, -ŋɨ́v but -ɣ́ay (corresponding to CSY -ŋat, -ŋit; -ɣi(i)t). There are, however, at least three other probable sources. One, as already mentioned, is vowel clusters at morpheme boundaries, e.g. conceivably *atata* 'paternal uncle' (in comparative table 1964:208, though not in vocabulary; cf. CSY and Alaskan Yupik *ataata*, and *ata* 'father'), *nucɨ̣x* 'wife' (if cognate with CSY *nuliiq*, other Eskimo *nuliaq*). From this latter, and e.g. *tāna* 'that one' (CSY *taana*, other Eskimo *tauna*), it appears that where vowel clusters did occur at morpheme boundaries, those clusters were subject to the same assimilation rules as in CSY,[8] producing long vowels which in non-initial syllables are presumably now distinct from short only in not being reduced to *ɨ*.

[7] I had earlier speculated that the rules for predicting the reduction might be "cyclic" (1973:809), but they have proven to be no such thing!

[8] See section below on Chukchi influence.

Another source of non-reduced *a i u*, less easy to explain, appears to be in specific suffixes in which such vowels, though historically short, are apparently retained, sometimes for no clear phonological reason, e.g. *aŋyípix* 'kayak, boat' (CSY *aŋyapik*, with suffix *-pik* 'real', Sirenikski generally *-pix*), but *aɣvíɣvix* 'passage' (CSY *aɣviɣvik*, with suffix *-vik* 'place', Sirenikski generally *-vix*). Inflectional endings, on the other hand, tend to have *-i-* if closed, but retain the vowel if open (sometimes with loss of final consonant), e.g. noun case endings, locative *-ni* (other Eskimo *-mi*), terminalis *-nu* (other Eskimo *-mun*), but vialis and aequalis *-kin*, *-tin* (other Eskimo *-kun*, *-tun*). Thus the phonological reduction rule may be overridden by lexical marking of varying firmness.

Another source, however, and perhaps the most common one, appears to be simple irregularity or inconsistency, as on one tape recording which I had a brief opportunity to hear, in which two speakers wavered between e.g. *ivíla*, *ivílu*, and *iválu* 'sinew', clearly because they, like all recent speakers, perhaps in fact all twentieth-century speakers, were also at least somewhat competent if not actually dominant in CSY, and therefore could restore the non-reduced version of any *i* from their knowledge of CSY. Such diffusion and dialect mixture could hardly fail to have a major effect on Sirenikski at its last stages, given the sociolinguistic situation. I shall add here only a few examples of such internal inconsistency: *aŋyíχpaχ* 'ship' (1964:210), *aŋyáχpaχ* (1964:180), *nukíłpiɣcíχ* (1964:192), *nukáłpiɣcáχ* (6.36) (CSY *nukałpiɣaq* 'young man'). So pervasive might such dialect mixture or diffusion or convergence ("Chaplinization") be by now that recovery of hypothetical "pure Sirenikski" might, even from the days of its earliest documentation, have required well-informed investigation of the parameters of the variability. It does not seem likely from the literature that this was ever done. The task is now a complex philological one.

Elmegård Rasmussen, in his important and provocative recent major work on comparative Eskimo (1979:103), posits an interesting rule that in Sirenikski "a short vowel of the final syllable or an open internal syllable of a word is reduced to /ə/," citing the examples (with his reconstructions), (**ciŋđaq* > **siŋđaχ*>) **siŋraχ* > **siŋrəχ* (> *siŋcəχ* 'beach'), **aki* > **akə* (> *aka*) 'price', (**ađuk* >) **aruχ* > **arəχ* (> *acəχ* 'blood'), (**kəzi-* >) **kəri-* > **kərə-* (> *kəcə-* 'alone'). Despite the countless counterexamples, e.g. *aŋyípix* (not *-pəχ*), *aɣvíɣvix* (not *-viɣ-*), cited above, or *akitəχ* (not *akətuχ*) 'avenges' below, which make it clear that modern Sirenikski phonotactics no longer abide by any such rules, it may be worth investigating the possibility that such a rule applied in Sirenikski at some earlier stage, for instance, in the inconsistent examples cited above, *aŋyíχpaχ* ~ *aŋyáχpaχ*, *nukíłpiɣcíχ* ~ *nukíłpiɣcáχ*, which according to the rule should be *aŋyáχpíx*, *nukáłpiɣcíχ*. There is at least some variation in that direction. The most convincing evidence would be morphophonemic variation according to such a rule. Though Elmegård Rasmussen does not cite any such cases, it seems possible that his rule might be based on just such a case, e.g. the paradigm for 'woman' (Menovshchikov 1964:40): *naxsəx*, *naxsəɣəm*, *naxsaɣnəŋ*, *naxsaɣnu*, *naxsaɣni*, *naxsaxkən*, *naxsaxtən*; *naxsəɣiɣ* (abs. and rel., other plurals like singulars), in which the variation *-sə-* ~ *-sa-* does indeed follow the rule. At the same time, however, there are countless failures of the rule, both in inflection, e.g. *aŋyəqa* 'my boat' but *aŋyəχpu* 'our boat' (1964:43), *taŋaχpu* 'our child' but *taŋaqa* 'my child' (from *aŋyəχ*, *taŋaχ*), and in derivation, as in *akəsaɣvíx* 'store', *akətutała* 'price', *akəpałuχ* 'expensive', *akəcəɣəta* 'earnings', but *akitəχ* 'avenges', *akitəqəχtəɣa* 'answers', all from *aki* ≷ *akə*. Thus, if there was once such a rule, it is by now so obscured by lexicalization (and Chaplinization) that only a great deal more investigation of the available data may allow us to come to any firm conclusion concerning it.

2.3 Sirenikski and CSY in prehistory

We may perhaps speculate a bit on the historical implications of the geographic and linguistic position of Sirenikski. Since Sirenikski is not known to have moved recently into the area where it is historically documented, but is evidently a relic of an Eskimo language that has been in that area for a considerable if indeterminate time, and yet is so fundamentally different from its immediate Eskimo neighbor Chaplinski (and still more different from Naukanski), it seems quite probable that

Sirenikski is the last relic, at the westernmost end of the Eskimo world, of a much older wave of Eskimo population in Chukotka than that represented by Central Siberian Yupik (and Naukanski). In fact, the fundamental Chaplinski-Sirenikski differences are so abrupt, on the one hand, while on the other hand Chaplinski and St. Lawrence Island are so nearly identical (more so than might be expected with over 40 miles of not always navigable open sea between them), such that the language of one group or side must have come very recently from the other, that one might well question whether Chaplinski or Central Siberian Yupik (as we know it), has been in intimate direct contact with Sirenikski for very long, and wonder where Central Siberian Yupik came from, and even whether it went from the mainland Chukotka to St. Lawrence Island, or the reverse.[9]

Finally, we may stress again that though documentation of this most divergent Eskimo language is now necessarily in its very last stages, the publication or dissemination of that documentation, and the analysis, evaluation and comparative use thereof are still in their early stages. We may hope to hear and learn much more yet from Sirenikski in the future.

3. Naukanski

While Sirenikski is at a geographical extreme of the Eskimo language area, Naukanski is strategically situated at a central point on Bering Strait, in all probability the point earlier connecting Siberian Yupik and Alaskan Yupik. Like Sirenikski, though, Naukanski is also problematical because of the limitations in documentation available to us, especially concerning the prosody, and also, as with Sirenikski, because we find somewhat unexpected results.

Given its intermediate geographical position, and that Naukanski is, in various phonological respects, of a nature intermediate between CAY and CSY, we would expect the Naukanski prosody to be either quite like that of CSY, or that of Norton Sound CAY, or something in between. We find that the prosody is indeed intermediate, but in a way we did not expect. I shall return to this question after a brief description of documentation of Naukanski, and after a few remarks concerning other phonological traits of Naukanski, some of which it shares with CSY and others of which it shares with CAY.

Our main source for Naukanski is Menovshchikov's 1975 monograph entitled *Yazyk Naukanskikh Èskimosov*, 512 pp., written in the early 1970s, from data obtained in 1948, 1954-55, 1960-61, 1965, 1970, and 1971 (phonetics, p. 15-32, morphology 33-341, texts 342-378, lexicon 381-512). The texts, one short and two long, were transcribed in 1948; the lexicon contains about 4,500 entries, Naukanski-Russian.[10] Menovshchikov himself had also earlier published some Naukanski data on a comparative basis in his major works and numerous articles, as early as 1949:571.

The other most important source for our purposes, accessible to us, has been a tape recording obtained by the University of Oslo from the Soviet Academy of Sciences in the 1950s, including a text told by the celebrated Naukanski musician and raconteur, the late Nututein. We have been able to transcribe most of the material on this tape, which we have found to be an extremely useful supplement to the Menovshchikov 1975 data, and a key to the interpretation of those data.

Documentation of Naukanski before 1948 is as follows: the first known wordlist was by Mikhail Robek (Ro(h)beck) in 1791 on the Billings Expedition, 272 items (1811); then, more than a century later, that of Gondatti in 1895, 353 items (1897); then Knud Rasmussen on his famous Thule Expedition in 1924, 253 items (1941); then Diamond Jenness in 1926, from informants in Alaska, about 500 items (1928); and perhaps Forshteyn in 1927-1934. The first texts are from Bogoraz in 1901, two very short ones, translated from Chaplinski into Naukanski and Sirenikski (published 1909, 1949). Of these known earlier materials only the Gondatti and Bogoraz have any stress marks, generally one per word. From 1948 Menovshchikov reports he transcribed 40 or 50 texts (1949:571,

[9] Note especially, S.A. Arutyunov's hypothesis that Chaplinski may be an intrusion from St. Lawrence Island (Dolgikh 1967:13, footnote).

[10] Where I have quoted from the texts I so indicate by text and sentence number, from the grammar by page number, and if unmarked, from the lexicon.

1975:12), only three of which were published (1975:342-378). Two Naukanski texts are also reported in the unpublished Rubtsova text collection at the Institut Yazykoznaniya, Leningrad. As also in the case of Sirenikski, a great amount of lexical material has been collected for Naukanski by N.M. Emel'yanova, so that documentation of Naukanski exists that is far more extensive than that which is presently accessible to us.

3.1 Naukanski vowel clusters and long vowels

One especially interesting phonological respect in which Naukanski is intermediate between CSY and CAY is in the flattening of diphthongs to long vowels (vowel cluster assimilation). The sequence *au* is clearly flattened to *aa* as in CSY, e.g. *taana* 'that one', *ataasiq* 'one', *aak*" 'blood' (with rounding preserved on velars and uvulars), as with CSY. The sequence *ua*, on the other hand, is consistently transcribed *ō* by Menovshchikov; on the tape it sounds very much like the sequence /ua/ of CAY, [oʊ], as in the first person singular indicative intransitive verb ending *-tua* (which, incidentally, is also strikingly like Alaskan Yupik in deleting the -ŋ-). The sequence /ua/ evidently resembles Russian "round o" enough to motivate Menovshchikov to write it as *ō*. Similarly, the sequence /ia/ is regularly transcribed *ē* by Menovshchikov, as in *kēk* 'summer', *mikísqē* 'his child' (p. 102, /mikisqia/, *mikísqiq* 'child'; *mikísqi* on p. 108 apparently in error), *mikísqēt* 'their child' /mikisqiat/; on the tape such sequences sound very much like the /ia/ of Central Yupik, e.g. [keæk] *kiak* 'summer', evidently resembling Russian *e* (i.e. [ye] or palatalization plus [e]) enough to motivate Menovshchikov to write it *ē*. The most problematical sequence is /ai/, which does not flatten to /ii/ as in CSY, but is transcribed by Menovshchikov in some cases as *ay*, e.g. *aɣpi* 'other' (CAY *aipaq*), but in some cases as *ē*, e.g. *qē* 'wave' (CAY *qaiq*), *tē-*, 'come' (CAY *tai-*), *tētuk* 'fog' (CAY *taituk*), *panēsak* 'without spear' (*pana-isak*), *panēt* 'their spears' (p. 109, /panait/). It would be worth verifying that the *ē* from /ai/, unless it has undergone metathesis, is in fact indistinguishable from the *ē* from /ia/. This is precisely what has happened in some Kobuk subdialects of Malimiut Inupiaq.

The sequence /iu/ appears to have flattened to [ii] as in CSY (and again also in Malimiut Inupiaq), e.g. *nuvúqaχmí* 'Naukan person' [nuvuqaχm̥ii], or *síti* 'ear' evidently [siiti], p. 474), but cf. *síûtik* 'ears' (p. 20), perhaps [siɣutɨk]; variants with -ɣ- preserved and -ɣ- deleted, showing both *iu* → *ii* as in CSY, and extent of retention of intervocalic voiced fricatives intermediate between that of CSY and CAY, *siɣuta* and *ciun*. Finally, the sequence *ui* is apparently preserved (as also in Malimiut Inupiaq), generally written *úi* by Menovshchikov, as in *kúik* 'river', (CAY *kuik*), or *úixta-* 'test' (CAY *uig-*), *úi* 'husband' (CSY *ugi*, CAY *ui*), but *yúinaq* or *yuɣínaq* 'twenty' (CAY *yuinaq*, CSY *yuɣinaq*), again indicating uncertainty concerning the extent to which -ɣ- is dropped in some of these cases. Presumably the sequence *ui* cannot be reinterpreted *uy* either, without violation of fundamental phonotactic rules, as would be the case, for example, in interpreting *kuik* 'river' as **kuyk*, given the common Eskimo total absence of final consonant clusters (i.e. of CC in any position other than intervocalic).

To summarize for Naukanski vowel cluster development, still transparent and with the status of highly productive synchronic rules: *au* → *aa* (with labialization of following velars or uvulars), *iu* → *ii* (with labialization likewise), *ua* → *ō* [oɔ], *ia* → *ē* [eæ], *ai* → *ē* (and *ay*); *ui* remains.[11]

[11] Menovshchikov recognizes *e* and *o* as uvularized variants of *i* and *u*. He also notes, though, that in Naukanski *e* and *o* may occur as phonetically distinct "stable" variants of *i* and *u* in a wider variety of environments, especially if stressed or initial. Already in his pedagogical grammar, mainly Chaplinski (1960:21-22), Menovshchikov notes that *i*, when stressed in Naukanski, is very often *e*, independent of uvulars. He notes likewise for *o* in stressed syllables, but not finding absolute minimal pairs, he considers *e* and *o* to be only variants of *i* and *u*, even for Naukanski. In his main academic grammar, primarily Chaplinski (1962:21-22), Menovshchikov mentions *e* only as a uvularized variant of *i*; he has a footnote mentioning Naukanski stressed initial *o*, in non-uvular environment, but finds no absolute minimal pair. In his Naukanski grammar itself (1975:17-18), Menovshchikov notes that *e* and *o*, besides being uvularized variants of *i* and *u*, also occur as stable and distinct variants of *i* and *u* in other environments when stressed, especially word-initial. However, he still quite explicitly considers them not in phonemic opposition with *i* and *u*, in the absence of absolute minimal pairs. (There are, of course, many items in his lexicon which easily come close enough to make phonologi-

However, at some taxonomic level in contemporary Naukanski there are evidently short *e* and *o* as well as long, in lexicon diffused from Chukchi, and now also Russian, both of which have plentiful distinctive *e* and *o*; e.g. from Chukchi: *èwírŋa* 'however' (also entered *ewúrna*, *ègúrŋa*; Chukchi *ewírŋan*, CSY *iwirŋa*), *ètópeł* 'preferably' (Chukchi *etʔopel*, CSY *itupił*). At that level the status of long *ē* and *ō* as such are clearly reinforced as part of a new vowel system, consisting of *i e a o u*, all long and short, plus *ɨ*.[12] In a sense the development of the underlying Eskimo vowel clusters *ai*, *ia* and *ua* specifically into *ē* and *ō* could be connected with the diffusional influence. However, this is by no means necessarily so, since these clusters have assimilated differently, not into *ē* and *ō* at all (but rather to *ii* and *aa*), in Chaplinski, though Chaplinski was subject to the same diffusional influence, while in Upper Kobuk Malimiut Inupiaq assimilations have taken place (*ai* and *ia* → *ē*, *au* and *ua* → *ō*) very similar to the Naukanski assimilations, where there was no Chukchi or Russian influence. Thus these particular Naukanski vowel cluster assimilations could easily be altogether internally (and naturally) motivated. The result, nevertheless, is that the Naukanski vowel system, the Chukchi (*i e a o u ɨ*), and the Russian (counting ы), are similar, with distinctive length in the Naukanski for five or perhaps all six vowels.

Clearly there are in Naukanski surface phonology distinctively long vowels and the one sequence, *ui*, of two unlike vowels. This last, plus the clear underlying structure and highly productive rules, no doubt make it preferable to interpret long vowels as pairs. In any case, the basic phonotactics of Naukanski in this respect are essentially those of CSY and CAY, intermediate in detail. (I shall return to the subject of the Naukanski vowel cluster assimilation pattern in connection also with Chukchi and Upper Kobuk Inupiaq in section 4 below.)

3.2 Naukanski initial closed syllable weight and alternate stress

A major question in determining the position of Naukanski prosodically within the Yupik group is whether Naukanski shows stress on closed initial syllable (with single vowel) as in CAY, or not, as in CSY. We shall address this question after a brief examination of the basic patterns.

Menovshchikov (1975:31-32) has a short discussion of Naukanski stress, consisting of the usual observations of tendencies toward patterns in words of two, three, four, and more syllables, more or less noting the alternate syllable stress, but noting also that this can be perturbed by "quantitative stress," and concluding simply that "in the Eskimo language, in all its dialects, the problem of quantitative stress, distinguished by the duration of pronunciation of the stressed syllable, remains little studied. Such stress often has semantically distinctive significance, so that distinguishing it appears indispensable. The problem of types of stress in the Eskimo language awaits further investigation." One should, of course, bear in mind that Menovshchikov was writing this in the early 1970s and

cal prediction impossible, and there are indeed readily recognizable minimal pairs in, e.g., paradigms (p. 109) *mikisqēt* 'their child', *mikisqīt* 'their children' [← *mikisqiat*, *mikisqiit*], along with *panāt* 'their spear', *panēt* 'their spears' [← *panaat*, *panait*].) Though he has *ē* and *ō* regularly transcribed throughout the book, and shows morphophonemic (ʾ) variants, e.g. *-ēt/-it*, apparently no explanation is given, or explicit suggestion that *ē* and *ō* might regularly arise from underlying sequences of vowels, although at one point (1975:21) it is noted that *panēsak* 'without spear' derives from *pana* and *-isak* by fusion or assimilation of the *a*, and earlier (1962:24-25) instances of vowel fusion (*slivanie glasnykh*) at morpheme boundaries are noted for Chaplinski, e.g. *aŋjā* 'his boat' from *aŋjaq* plus *-a*, *aŋjī* 'his boats' from *aŋjaq* plus *-i*, and *tānā* 'that' from *ta* plus *ana*. It is further noted (1962:25) that the past tense suffix [-ma] in Naukanski involves a "diphthong" *āā*, as in *kāsimāāq* 'he arrives', though not in Chaplinski *kāsimāq* (viz. *kaasimaaq*", *kaasimaaq*); later, however, the absence of the "diphthong" in Naukanski is noted (1975:235), in *akimat* 'they answered' vs. *akimāāq* 'he answered' (viz. *akimaat* vs. *akimaaq*"). Finally, Menovshchikov and Vakhtin most recently (1983:26-27) mention *e* and *o* as uvularized variants of *i* and *u* in Chaplinski but recognize them as independent phonemes in Naukanski; they do note explicitly (1983:41, *slivanie glasnykh*) the Chaplinski process *aŋya-i* → *aŋyi*, but do not show other vowel assimilations, or mention vowel length or Naukanski *e* or *o* in this connection.

[12] Even *ɨ* may occur long, if only marginally, as in *kiixu* '(Bering) Strait' (or 'Cape Prince of Wales'?). Cf. Kaplan section 2.2 in this volume, *kiiɣyin* or *kiikti* 'Cape Prince of Wales', Diomede subdialect of Bering Strait Inupiaq dialect, < *kiŋik-* 'high', mainland subdialects *kiŋiɣyin*, *kiŋikti*, *kiŋiɣyin*, *kiŋikti*.

in relative isolation from non-Soviet work.

From Menovshchikov (1975) and the tape, we can easily confirm the basics—for example, that there is alternating stress as in *anéŋaq* 'older brother', *anɬxutíkuɬíɣi[i]t* 'group of brothers', where clearly *i* can bear stress as well as *i a u* (as in CSY and Norton Sound CAY). There are also plenty of instances of perturbation of this pattern by long vowels, e.g. initially *kēɣniqáquq* 'hungers', or, as Menovshchikov himself notes (p. 32), internally, e.g. *nunúsēquq* 'mends' ("dynamic stress adjoining quantitative"), and on the tape, [sitú·x̣ʷâ·ɣumá·luku] 'was sliding down' (ˆ falling tone) [isx̣á(·)pá·malúku] 'as he was looking'. There does not appear to be distinctive gemination before double vowels following unstressed syllable, as e.g. *unōqu* 'on the morrow' (Text 2.5), [imâ·nun] 'to water' (tape), [amá·tŋani] 'on the other side of it' (tape), wherein Naukanski is like CSY and unlike CAY. It is not entirely clear whether there is a stable contrast between long and short vowels in open syllables following unstressed syllables (CSY overlong vs. lengthened), but it appears from the tape that there is at least a tendency in that position for long vowels to have falling tone and perhaps more length, e.g. [imâ·nun] vs. [pamá(·)vik] 'up there', again as in CSY, where, however, the overlength distinction is lost in certain subdialects (as discussed in my supplementary notes on CSY prosody in this volume). That distinction may be lost, or partly so, in Naukanski as well.

In interpreting the data in Menovshchikov (1975) for what is perhaps the major prosodic difference between CSY and CAY—whether closed initial syllables with short vowel are stressed—we find what appears to be great inconsistency. In disyllables this is as expected (both syllables open): *ápi* 'snow', *así* 'below', *ákí* 'price', *akí* 'other side' (same item), *akúq* 'hem', *áquq* 'stern', *pánà* 'spear', *paník* 'daughter', even probably *ānaq* 'excrement' (unless in Naukanski also some old segment or feature is reflected in such forms. See note 6); likewise with both syllables closed, e.g. *anyáq* 'baidara', *akmák* 'backpack', *áɣnaq* 'woman', *áɣvíq* 'whale', *aɣníq* 'typhoon'; or even with the first syllable closed and the second open, e.g. *támlu* 'thumb', *tafsí* 'belt', *aɣlú* 'whale jaw'; thus a fairly even weight on both syllables seems to be reflected even where the first is closed, unlike CAY. However, in polysyllables with closed first syllable, the inconsistency persists to some extent: in trisyllables, e.g. *áɣnaɣáq* 'girl', but *aɣvípik* 'gray whale'; and in the grammar section, p. 39, *anyámun*, *áɣnamun*, *níx̣samun* ('baidara', 'woman', 'seal', all terminalis), p. 99 *aɣnámun*; text 3.19 *qúvŋimun* 'reindeer (terminalis)', but *quvŋíɬik* 'reindeer herder'; *úkpíɣim* 'owl (rel.)' 1.10, 1.18, 1.22, but *ukpíɣit* 'owls' 1.32. This inconsistency is neither like CSY (decisively [aɣná·mun]) nor like CAY (decisively [áɣnamun]), but rather suggests a balance in weight on the two first syllables, as in the disyllables. This balance is confirmed in at least some of the forms on the tape, e.g. *ɨtx̣ákun ánŋámi* 'when he went out through his anus'. The general impression one gets from the tape is one of greater flexibility, especially in tonality and degrees of lengthening, a far less clear-cut system. In a form such as *ányápik* 'boat' or *áɣnámun*, one can perceive a balance between the alternate syllable stress assigned to the second syllable, and the weight of the closed first syllable. The second syllable is little, if at all, lengthened. To judge from the tape, such lengthening of full vowels in open stressed syllables is rather less definite in Naukanski in the first place, than in CSY or prosody, but not, it seems, to the point where, as in CAY initial syllables, it overrides the alternate syllable stress, but rather interacts to balance with it.

In polysyllables with closed initial syllable with short vowel, followed by open syllables, the stress seems more commonly to be written on the second syllable, and on the following even-numbered syllables, as e.g. *aɣyúqiqúvik* 'if you are bored' 2.168, 191, *quxtúqakun* 'hip (vialis)' 3.113, *anlísaɣāni* 'his (own) foster child' 3.42, *nansáqatāɣa* 'kept towing it' 2.108, but there are many counterexamples, e.g. *áɣviŋúmalɣit* 'went whaling' 2.8, *áɣviŋílɣit* 'prepared to hunt whales' 2.22 (even *áɣviŋíɬɣit* 2.16), /aɣviŋílɣiit/, thus no tendency for alternate stress to work backwards), and cases of fluctuation, e.g. *qantáɣakun* 'soon' p. 430, *qantáɣakún* 2.178, but *qántaɣākun* 2.30, *mantíɣamun* 'to the house' 3.45, but *mántíɣámun* (tape). The prosodic principles operating here can be interpreted as an extension of those posited for the trisyllables with closed short first syllable and open short second, in something of a phonetic balance. Here, though, the alternate stress operates usually start-

ing on the second syllable, also the one which Menovshchikov more often chooses to note as more prominent, according to the fundamentally deuterotonic pattern. Sometimes, however, the stress does indeed appear to have fallen definitively on the first syllable, e.g. *qántaɣáku*n, *mántiɣámun*, where closed initial syllable weight has attracted the stress as in Alaskan Yupik. In these instances the order of alternate syllable and closed syllable stress rules is reversed.

In words of three or more syllables, where the first syllable is not long and the second is closed, the second syllable is usually the one written with stress, whether the first is closed or open, since here both the deuterotonic alternate syllable stress and closed syllable weight combine to produce a clear impression and regular transcription, e.g. *aqúmvik* 'place to sit', *aqúxti* 'steersman' (perhaps never CV̆CVCCV), and also usually *qantáxqaq* 'binding', *amłúɣvik* 'place to walk', *aɣvíqɾak* 'whale meat', *kixsíɣlukúłu* 'and observing it' 3.111, *quyŋíxquɣáquq* 'herds reindeer'.

Evaluating the prosodic position of Naukanski so far in this analysis, it would appear indeed to be intermediate between CSY and CAY, basically like CSY, without the always definitive closed initial syllable stress of CAY, but nevertheless with some balancing weight on closed initial syllable, which also can potentially override or preclude the alternate stress.

3.3 Naukanski closed syllable weight more generally

In looking further at the behavior of closed syllables after syllable two in polysyllables (without long vowels to complicate the picture), we noted frequent accent transcription irregularities (i.e. departures from alternate syllable stress) in connection with the closed syllable, e.g. *kɨlílŋaqłuku* 'watching him' 3.118, in which the expected alternate syllable stress on *-lu-* is absent, in a way that is reminiscent of what we first called "stress-skipping" in GCY, e.g. [áŋyáxpaka] 'my big boat', as opposed to Norton Sound [áŋyaxpá·ka]. Here we may posit some weight on the closed syllable *-ŋaq-*, though not marked by Menovshchikov, which has retracted or removed the expected stress and length off *-lu-*. This process is confirmed in *qúvŋixqúɣluni* 'herding reindeer' p. 436, according to which, without the retraction, we should expect *quyŋíxquɣlúni*, but here the retraction from open *-lu-* onto the preceding closed *-qúɣ-* has caused Menovshchikov to hear the stress contour of the preceding two syllables differently as well. We have been able to confirm these phonetics on the tape in such forms as *sitúrə̆ɣluni* 'as he slid', stress uncertain on *-raɣ-*, but definitely missing on *-lu-*; *navɣáasɬ̆ɬi-qámkin* 'I'll reward you', with stress retracted from *-li-* or skipped to *-qám-*; likewise *itiqə̆̀xtiŋámi* 'when he went in', *ináɣə̆̀xtiŋan* 'when he suddenly lay down', *anúquxtipíxti* 'gale', *awátáxpak* 'float' (cf. Menovshchikov *awátaxpák*). There are also abundant counterexamples to this, especially in Menovshchikov's texts, e.g. *niɣnáyukłúki* 'wanting (me) to eat it' (?) 2.155 with stress remaining on *-łu-*; *nayúqixpínán unúɣaqnáku* 'not watching at nightfall' 3.19 (retraction or skipping from *-pi-* in first word, but no retraction or skipping from *-ná-* in second word); *siɣíqŋaxqáqikī* 'difficult to stop' 3.29 (no retraction or skipping from *-qá-*).

It is, in any case, clear that non-initial closed syllables may at least sometimes affect the alternating stress pattern on short-vowel open syllables, attracting some weight to themselves from the following short open syllables, or at least preventing the expected stress from occurring on the following short open syllable. In this respect, Naukanski resembles most closely not Norton Sound, the Alaskan Yupik closest to East Cape, but instead closely resembles GCY, farther to the south, which shows the same "skipping" or retraction in connection with non-initial closed syllables. If we have called the CSY pattern "stage one" in complexity, Norton Sound "stage two," GCY "stage three," etc., it might be said that Naukanski in some respects falls expectably at "stage 1.5," with respect to initial closed syllable weight. However, with (inconsistent) perturbation of alternate stress by non-initial closed syllable weight, Naukanski definitely would seem out of place in approaching stage three. We might best consider this resemblance to stage three coincidental, though, rather than as evidence of a specific closer historical relationship between Naukanski and GCY than between Naukanski and Norton Sound Yupik, especially since a far better explanation for the Naukanski retraction or skipping in connection with non-initial closed syllables, and at the same time also for initial closed syllable

stress, can be seen in a single principle of closed-syllable weight (absent in CSY, present in CAY). In Naukanski, this principle of closed syllable weight can be seen to interact in some kind of balanced or wavering combination with the alternate syllable stress principle, with inconsistent results, quite unlike the case in CAY, where the closed syllable weight decisively overrides the alternate syllable stress (initial closed syllable weight overriding alternate stress in all CAY, non-initial overriding it in all CAY except Norton Sound), and unlike the case in CSY, where closed syllable weight is not a factor at all.

3.4 Variability or dialectology within Naukanski

The situation with the much more delicate phonetics in Naukanski is further complicated for us not only by the limited and problematical data we presently have access to for this language, but may also be complicated by another factor that needs to be mentioned for consideration and urgent further research. The inconsistency and flux in both the available transcriptions and the tape may be due not only to the difficulty of hearing and transcribing the delicate balances in the phonetics of Naukanski prosody (further affected by discourse-level factors which are in no way sorted out), but also to genuine flux and inconsistency in the language itself, which may be partly due to dialect or subdialect mixture. It seems quite likely that Naukanski is an amalgam of a range of dialects that we know was once much more widespread, at least to the north(west) of the point at which it survived until 1958. Moreover, that point itself is also the contact point with Alaskan Yupik (and Inupiaq)—an Eskimo Byzantium, once even the crossroads of the world.

In this connection, the early statement by Carl Heinrich Merck in 1791 becomes particularly relevant. Merck, a keen observer with the Billings Expedition, left a journal describing the Chukchi and Eskimo of Chukotka (Saltykov-Shchedrin Library, Leningrad, Manuscript Division, Fond 4, No. 173, 64 pp., in German, not seen; Russian translation published by Z.D. Titova 1978:98-154). This includes a most interesting statement concerning the distribution of the sedentary Chukchi (Asiatic Yupik) languages and dialects (Titova 1978:99-100. Part of this statement is also earlier translated in Vdovin 1954:76-77). According to Merck, the Asiatic Eskimo inhabited the coast of Chukotka from Serdtse Kamen' (nearly Kresta Bay) around to Shelagski Cape (nearly Chaun Bay). Their language, completely different from Chukchi-Koryak, had four varieties (*narechiya*, both translations), distributed as follows: the first from Serdtse Kamen' to *Uigin* camp (Titova 1978; read *Aygan* by Vdovin 1954); the second from *Uigin* (*Aygan*) to *Puuchta* (Pouten, 25 miles south of East Cape); the third from *Puuchta* to camps *Nuchin* and *Peaeky* (Naukan and Pèèk, on the south corner of East Cape); and the fourth, called *Uwelenskije* (after Uèlen, on the north corner of East Cape), from East Cape to Shelagski Cape (600 miles to the northwest). The first variety must be Sirenikski and the second Chaplinski; the exact location of the border between them, *Uigin* (or *Aygan*), I cannot identify, but it must presumably have been not far from where it was in this century, since Merck also states that the language of Chukchi Cape (between Provideniya Bay and Chaplino) is "almost the same" as that of St. Lawrence Island (i.e. CSY). From Merck's account, confirmed by recent information (as reported especially in Krupnik and Chlenov 1983), the Chaplinski language extended along most of the Beringian coast of Chukotka, past Mechigmen and St. Lawrence bays, to Pouten. The Eskimo forms in Merck's text (Titova 1978), evidently from Mechigmen and/or St. Lawrence Bay, where Merck had his main contact, are essentially or predominantly Chaplinski, also in accordance with the distribution statement. (For location see Map 2.)

Merck's two remaining varieties of Asiatic Eskimo, both spoken on East Cape, are probably both represented by Naukanski of today. Merck (Titova 1978:100) also mentions that the (formal) vocabulary (*slovar'*) compiled was of *Uwelenskije*, the fourth *narechie*. (Vdovin 1954:77 must surely be incorrect in identifying Merck's forms [Chaplinski] in the manuscript text with the formal Uelenski vocabulary.) If that (formal) vocabulary is indeed the one attributed to Robeck, published by Sarychev in 1811, as Titova herself is very probably correct in noting, Uelenski is then definitely a form of Naukanski. (Prosodic differences may have been very significant, but those are precisely

what would be least detectible in that source.) Then, unless the village of Naukan itself changed language between 1791 and 1895, the third *narechie*, Pouten-Naukan, was, of course, also a form of Naukanski. Mixture of the two dialects might indeed explain fluctuations such as *qantáγakún* ~ *qántaγakun* observed in Naukanski today (the former Pouten-Naukan, like CSY; the latter Uelen-North Coast, with prevalent closed syllable weight). It seems, moreover, to be a theoretically interesting question, whether such fluctuation from prosodic principles in unresolved conflict could arise within a single language or dialect without such dialect mixture.

It is obviously a matter of high priority to determine the extent to which speakers of Naukanski today can provide information on linguistic variation and perhaps also on the origins of that variation—for instance in the prosody, to provide some answers to specific questions on the variability of stress patterns, and on the phonetics and distinctiveness of vowel length. There have also been some speakers of Yupik at Uelen, some of whom might conceivably even represent an unbroken Uelenski Yupik tradition, along with those who have moved there from Naukan or from the points to which the Naukan community has been dispersed since 1958. The relocations of the Naukan community itself and the sociolinguistic situation of Naukanski since 1958 are matters that should be considered by linguists concerned with Eskimo.

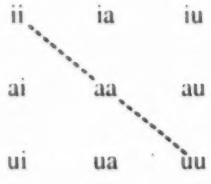
4. A note on the influence of Chukchi on Asiatic Eskimo phonology more generally

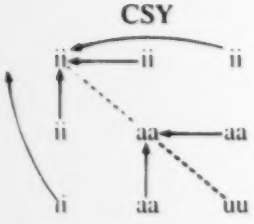
Probably the clearest evidence of Chukchi influence in Asiatic Eskimo phonology, here Central Siberian Yupik and Naukanski, is in the vowel-cluster assimilation rules in both Eskimo languages. Chukchi has double vowels, but unlike Alaskan Yupik, and like Central Siberian Yupik, it has no clusters of unlike vowels morpheme-internally, or even at morpheme boundary: Chukchi thus *qorat* ~ *qaat* 'reindeer (pl.)', *qora* + *en* → *qoren* 'pertaining to a deer' (except, curiously, where preceded by CC; see Skorik 1961:41-42, Krause 1980:108).

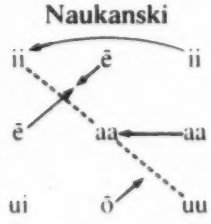
While all Alaskan Yupik preserves the clusters *ia, ai, ua, au, iu, ui*, CSY, as noted, assimilates them by a principle of dominance, *i* over *a* over *u* (thus *ia, ai, iu, ui* → *ii*; *au, ua* → *aa*). Naukanski also assimilates most vowel clusters, as shown in the preceding section, in a pattern partly resembling that of CSY, but for some reason perhaps resembling still more Upper Kobuk Malimiut Inupiaq in Alaska, in a manner that is puzzling if not coincidental.

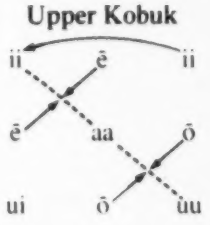
I shall here consider the position of Naukanski in terms of its vowel assimilation pattern in the following table, between Central Siberian Yupik and Upper Kobuk Malimiut Inupiaq, as these surface patterns derive from and correspond with the basic pattern of two-vowel sequences, which is still the underlying synchronic pattern of these three forms of Eskimo (and also the surface pattern still of all Alaskan Yupik and most Inupiaq).

Along the dotted diagonal in the diagram are the three or five points of non-diphthongal or fully assimilated vowel pairs: [ī (ē) ā (ō) ū].









In only one respect is Naukanski more like CSY than like Upper Kobuk, in that *au* → *aa* (with labialization on following velars). Insofar as *ai* → *ē* [1] (asymmetrically from *au* → *aa*), and *ia* → *ē* also, Naukanski most strongly resembles Upper Kobuk. The development partly symmetrical to that, *ua* → *ō* (or [oɔ]) is much less significant, verging on phonetic triviality, especially in that it remains distinct from *au* (→ *aa*). In this context it is difficult to decide whether the Naukanski retention of *ai* in common with Kobuk (the only unassimilated vowel cluster left in Kobuk; likewise in Naukanski, except in a sense for *ua*) is purely coincidental or significant. There is no known direct historical connection between Kobuk Malimiut and Naukanski. In the intervening Bering Strait Inupiaq dialect, which was in direct contact with Naukanski, there is a strong but purely phonetic tendency toward *ai* → [ē], *au* → [ō], but no general tendency toward merger with *ia*, *ua*. The very asymmetry of the Naukanski shifts, incidentally, may well be further indication of a mixed origin for Naukanski.

Clear, at any rate, is the result that Asiatic Eskimo has assimilated all vowel clusters (except Naukanski *ai*, and in a sense *ua*) into long vowels. Chukchi also disallows (assimilates) all such clusters (except marginally), and Asiatic Eskimo has long been in close contact with Chukchi. Alaskan Yupik, on the other hand, retains the clusters as such, without assimilation, and has not been in contact with Chukchi. It therefore seems probable that this innovative Asiatic Eskimo vowel-cluster assimilation is connected with the influence of Chukchi.

The only other obvious influence on Asiatic Eskimo phonology from Chukchi is in the presence of retroflex consonants. Chukchi has both retroflex fricatives and affricate, totally absent in Alaskan Yupik (except for [r] in later Russian loans), but present also, both fricatives and affricate, in Sirenikski, and (voiced and voiceless) fricatives in CSY and Naukanski. These retroflexes are not only in Chukchi loans, but also in at least a fair number of native Yupik morphemes. Something like these fricatives was also evidently present in Proto-Eskimo, but only Alaskan Inupiaq and some Greenlandic regularly preserve them as such, while Sirenikski preserves them as [ç]. Elsewhere, however, including CSY and Naukanski, they have generally changed to *y* and *s*. The origin of the CSY and Naukanski retroflexes needs further study.

Chukchi influence on Yupik prosody is much less clear. Chukchi has prominent phonetic stress, but its occurrence or function is not yet adequately documented, described, or explained. Skorik (1961:67-71) and Krause (1980:1, 122-131, 142-143) attempt some analysis. While there are not distinctive vowel lengthenings or consonant geminations connected with Chukchi stress, it is reminiscent of the Yupik stress in that it occurs on the stem and moves only within the stem, does not occur on ə as readily as on other vowels, and interacts with affixation and with deletion or insertion of ə. Such similarities appear far less language-specific than the previous ones, however, but appear rather to be the result of very common natural phonological processes. Moreover, these principles of stem-stress and ə-relatedness Alaskan Yupik most definitely shares with CSY-Naukanski, whereas Alaskan Yupik does not at all share the most obvious influence by far of Chukchi on Asiatic Eskimo, the very extensive loanword lexicon, including the whole

[1] In addition to *av*. It should have been noted in 3.1 above, that occasionally also *ai* → *ii* in a few instances at postbase morpheme boundary in Menovshchikov 1975, e.g. *avâqutisaq* 'without offspring', p. 256 (along with *panêsak* 'without spear', p. 21); *aγnînaq* 'only a woman', p. 194; *sitâγînaq* 'only reads', p. 194 (along with *aγnênaq*, p. 54; *qavênaqaq* 'only sleeps', p. 54, 194). These relatively infrequent variants with *ii* may well be attributable to diffusion from CSY.

(The source of Naukanski *ii* in the form *anyî* 'their baidara', p. 113, is a different matter, presumably either in error for *anvê* 'his baidaras', or for a probable *anyii* 'his baidara' [along with the regular *anyaa*]; cf. also *aniŋit* 'their older brother', p. 362.140 [i.e. *aniŋiit* ← *aniŋaq* + *at*]; *uyuγita* 'their younger brother (rel.)', p. 362.143 [i.e. *uyuγiita* → *uyuγaq* + *ata*]. Similar variants occur in Alaskan Yupik [e.g. *aŋyii* along with *aŋyaa*], as part of a process still more common for *aŋa* → *ii* and *aγa* → *ii* than *aγa* → *ii*, a notabale innovative trait which Naukanski shares with Alaskan Yupik, and not CSY; e.g. *atii* 'their father', p. 359.40 [i.e. *atiit* ← *ataŋat*, CSY *ataŋat*, CAY *atiit*]. Therefore, in addition to *panâtŋa*) 'his spear', p. 108 [i.e. *panaa* and *panaŋa*], there should probably also be added yet a third presumably possible Naukanski variant *panii* [CSY *panaŋa*, CAY *panii*]; cf. also *wi* 'I' [i.e. *wii*, CSY *waŋa*, CAY *wii*]; *niquγ-* 'to hear' [i.e. *nii-quγ-*, CSY *naγaii-*, CAY *niiii-*]. Thus, the source of this Naukanski *ii* is from *a-a* with deleted uvular or velar, as in Alaskan Yupik, and not from *a-i*.)

category of adverbs. It therefore does not seem at all obvious or probable that Yupik prosody, the basic principles of which are shared by both Alaskan and Siberian Yupik, has its origin in Chukchi influence, but rather that Chukchi influence is confined to Asiatic Eskimo (uniformly to Sirenikski-CSY-Naukanski), where it is manifest in the vowel-cluster assimilation, retroflexes, and above all in the lexicon, not shared by Alaskan Yupik.

These observations do not close the case. More needs to be known about Chukchi stress, and for that matter, also Koryak (see especially Zhukova 1972:40-41). Kodzasov and Muravyova's description (1978) of stress on Alutor (a variety of Koryak), shows that there stress must fall in the first two syllables of the word (confining it to the stem), can fall on ə only in closed syllables, and may not fall on the final syllable (thus *tərak* → *tərák* → *tərákki* 'to cut'). Ironically, though this may be reminiscent of Yupik, it resembles Alaskan Yupik more than it does Siberian Yupik, in that Siberian permits stress on ə in open syllables (without geminating the following consonant), while Alaskan does not, and Siberian Yupik totally avoids gemination, while in Alaskan it is an important phonological process. We must not conclude, obviously, that Alaskan Yupik prosody is historically more closely related to Chukotan than Siberian Yupik prosody is, but only that no historical relationship is evident. Therefore, the Yupik prosody, characterized in the papers in this volume, has its origins quite evidently within Yupik itself, or at least not from any known external impetus.

SEWARD PENINSULA INUPIAQ CONSONANT GRADATION AND ITS RELATIONSHIP TO PROSODY

Lawrence D. Kaplan

1. Introduction

Relatively unfamiliar to scholars of Eskimo are the Inupiaq dialects spoken on the Seward Peninsula of Alaska, on the islands in Bering Strait, and in the vicinity of Norton Sound as far south as Unalakleet. Seward Peninsula Inupiaq lies at the southwesternmost end of the Inuit dialect continuum, which stretches east across the Arctic to Greenland. Along the shores of Norton Sound is the borderland where Inupiaq and Central Yupik meet; several villages in this area contain mixed populations with respect to the two language groups, and bilingualism is common.

Seward Peninsula is one of two major Alaskan Inupiaq dialect groups, the other being North Alaskan Inupiaq, which comprises the North Slope and Malimiut dialects. Seward Peninsula likewise may be subdivided into the Bering Strait and Qawiaraq dialects. The Bering Strait dialect is spoken near the extremity of the Seward Peninsula in Shishmaref, Wales, Teller, and Brevig Mission, as well as on the islands of Bering Strait itself, King Island and the Diomedes. Qawiaraq (also, Qaviaraq or Kawerak) was originally found at the site of the same name near present-day Mary's Igloo on the Kuzitrin River; it is also found on the southeastern portion of Seward Peninsula, where the Fish River dialect is spoken at White Mountain and somewhat at Council and Golovin. In historical times, the Qawiaraq of Kuzitrin River expanded eastward to the head of Norton Sound at the villages of Shaktoolik and Unalakleet, with some speakers also at Koyuk. Here it meets the northernmost dialect of Central Yupik, Unaliq, and also a branch of Malimiut Inupiaq of the North Alaskan group which moved south, probably in the first half of the nineteenth century, from the Buckland area in the northeast corner of Seward Peninsula.[1]

The presence of different dialects of both Yupik and Inupiaq in the Norton Sound area today is most directly the result of movement by Inupiaqs—and Nelson Island Yupiks to Stebbins—into the original Unaliq Yupik language area over the past two centuries. The result of these population shifts has been to overpower Unaliq, of which a few dozen speakers remain, and to make Inupiaq dominant from Unalakleet north. All forms of Eskimo, however, are now moribund in this entire area; the language of the younger generation is English only.

Inupiaq migration has had the effect, therefore, of moving the language border south, and evi-

[1] Dialects and languages are indicated with the following abbreviations: BS, Bering Strait; CY, Central Yupik; D, Diomede; I, Inupiaq; KI, King Island; M, Malimiut; NAI, North Alaskan Inupiaq; Q, Qawiaraq; Sh-W, Shishmaref-Wales; Sir., Sirenikski; SLI, St. Lawrence Island Yupik; SP, Seward Peninsula.

Eskimo forms are given in phonetic orthography, with *g* for [ɣ], *ł* for [l̥], and *e* for [ə] or [i]. Long vowels are written double, but long consonants are indicated with a double letter only when not predictable by automatic phonological processes, viz. Central Alaskan Yupik Automatic Gemination and Seward Peninsula Consonant Gradation as described below. Original diphthongs, *ai* and *au* have become phonetic long vowels, [e:] and [o:], respectively, in Bering Strait as in many other Inupiaq dialects, but are written here as *ai* and *au*. Other vowel clusters are *ia*, *ua*, *iu*, and *ui*. The modern Inupiaq reflex of *ə is written *i* when I wish to distinguish it from other occurrences of *i*, although the practical orthography makes no such distinction. See also below.

dence shows that as recently as the early years of this century, Unaliq groups were probably present along the southern shore of Seward Peninsula as far north as Cape Nome. Up the coast from there was found an earlier language border, since the next villages to the north and west were Inupiaq, Sledge Island and Sinuk on the mainland. In section 2.4, I will present linguistic facts which suggest earlier language configurations for the area, and speculation on where earlier language borders might have been.

The dialect split between the North Alaskan and Seward Peninsula groups is based principally on phonological criteria, although lexical and morphological differences also figure importantly. Seward Peninsula lacks one of the major phonological innovations which characterizes large portions of Eastern Eskimo, including North Alaskan Inupiaq, that being a process of assibilation and palatalization which acts on alveolar consonants (and some velars in Malimiut). This phenomenon is closely related to another Inupiaq innovation, the reduction of the basic vowel system to three short vowels through the loss of the schwa found in Proto Eskimo (Kaplan 1981:76-93, 110-155). Simply put, most schwas became *i*, now indistinguishable phonetically from original instances of *i*. The neutralized historical vowel contrast is recoverable to a great extent through phonological processes, such as assibilation and palatalization, which are conditioned only by reflexes of **i* and not by *i* derived from schwa. The absence of these processes in Seward Peninsula is no doubt related to the fact that these dialects show incomplete neutralization of the historical *ə*/*i* contrast. Whereas some mainland dialects of the region have lexicalized instances of phonetic schwa, the Diomede dialect retains the full contrast.[2]

The retention of the fourth vowel in Diomede is an important feature which disqualifies this criterion as a strict and clear-cut point of separation between the phonologies of Yupik and Inupiaq. In fact, remnants of (phonetic) schwa probably persist in several Inupiaq dialects even in North Alaska,[3] with the full four-vowel system preserved today only on Diomede. Another distinguishing characteristic of Seward Peninsula phonology, and the central subject of this paper, is the presence of a consonant gradation system related to the prosodic systems found throughout Yupik but absent in other Inuit dialects.[4]

The effect of Seward Peninsula Consonant Gradation is to lenite or delete consonants in alternating syllables. Although the process affects syllables throughout the word according to a regular pattern related to that of stress in Yupik, in Inupiaq it is in no way to be heard, at least synchronically, as phonetic stress, a fact which differentiates it sharply from related phenomena in Yupik.

In succeeding sections of this paper, I shall describe the Seward Peninsula Consonant Gradation system, compare it with Yupik prosodic systems, and discuss historical ramifications both within Inuit and overall for Eskimo.

2. Consonant Gradation

Consonant Gradation in Seward Peninsula Inupiaq was first written about by Diamond Jenness (1927), who observed regular correspondences between the Cape Prince of Wales dialect and dialects of the Alaskan North Slope, Canada, and West Greenland. He points out the lenition of intervocalic stops to voiced fricatives and the deletion of some voiced fricatives, as well as other interesting correspondences, but does not explore the system behind these regular phenomena. Jeffrey Leer gained an understanding of the essential mechanics of the process in 1972, and I started exploring it in greater

[2] Interesting vowel harmony rules unique within Eskimo govern the Diomede vowels *i* and *ə* (see Kaplan 1982b). For references throughout, see the list at the end of this volume.

[3] Knut Bergsland and I have both heard isolated instances of what appears to be an etymological schwa in Nunamiu Inupiaq, e.g. [ini] for 'place, house'; other NAI [ini].

[4] The main other phenomenon in Inuit which bears a resemblance to Alaskan prosodic processes is Schneider's Law, found in Quebec and Labrador, which prevents the occurrence of successive closed syllables by causing simplification of the second in a series of clusters or geminate consonants, thereby opening the second syllable. A similar process is reported by Dorais and Lowe (1982) in their "Les dialectes de l'Arctique de l'ouest," for Sigliq Eskimo, where geminates are simplified following a consonant cluster.

detail in 1974. To date, the most sizeable work in print on Bering Strait Inupiaq is G.A. Menovshchikov's *Yazyk Eskimosov Beringova Proliva* (The Language of the Eskimos of Bering Strait), published in 1980, which treats the Diomede dialect, based on work with Big Diomede (Imaklikski) speakers in the Soviet Union. From my own experience working in Alaska with natives of both Big and Little Diomede islands and from Menovshchikov's data, I have observed that the two groups speak the same dialect with the possibility of a few minor differences. Menovshchikov's Diomede material, especially the texts, includes abundant variant forms that are clear evidence of a fully operational Consonant Gradation process as expected throughout Bering Strait Inupiaq, although no treatment of the process as such is given in the book.

Whereas the Consonant Gradation system, hereafter CG, is motivated in the same way throughout Seward Peninsula Inupiaq, actual results of the system's operation differ according to dialect, and it is in part on the basis of such differences that dialectal variation within the Seward Peninsula group can be characterized. Dialect differences in effects of CG are of two essential types: (1) the output of the rule differs, that is, the same consonants yield different variants when they undergo CG; and (2) CG is found to be productive to varying extents in different sub-dialects, or nearly non-productive, as is the case for Qawiaraq.

The purpose of this paper is to demonstrate the workings of CG and to this end I have chosen to describe primarily King Island Inupiaq, one of the Bering Strait dialects, representative of CG in its fullest form, since the system functions here almost exceptionlessly—as much so, in any case, as in any other dialect. Following the discussion of CG in King Island, however, I present in sections 2.2 and 2.4 a summary of variations within the system found in other Seward Peninsula dialects, especially Qawiaraq.

Unlike the prosodic systems of the Yupik languages, CG is not a system of stress assignment. Word stress is assigned after CG applies, with no consideration of whether a given syllable has or has not been altered by CG. Whereas CG affects alternate syllables, as explained below, resembling Yupik prosody in this respect, word stress is assigned individually to syllables practically regardless of what precedes or follows.

The basic stress rule for King Island Inupiaq is that the non-final closed syllables and all long vowels—including diphthongs and vowel clusters, which are phonetically long—receive stress. Thus, *ā́viq* 'walrus', *íglu* 'sod or rock house', and *Iníktuyū́uq*, a personal name. Whereas long vowels (*aa, ii,* and *uu*) and diphthongs (*ai* [e:] and *au* [o:]) are stressed uniformly throughout their entire quantity, vowel clusters (*iu, ui, ia, ua*) receive stress on their second member, e.g. *puítuq* 'it is swollen', except in a word-final syllable, e.g. *úi* 'husband' and *niγiřúaq* 'one who is eating'. A long consonant, like a consonant cluster, has the effect of closing the preceding syllable, e.g. *mánnik* 'egg'. Long consonants may be underlying, as in *mannik*, or may result from CG. In *iříituq* [iřít:uq] 'it fell', whose syllables would otherwise be equally stressless, CG has the effect of lengthening the *t* and closing the preceding syllable, which is then stressed. Therefore, although CG does not itself assign stress, it may condition stress assignment by creating a closed syllable or, for that matter, remove the conditions for stress by creating an open syllable. The latter situation is found when CG deletes a syllable-final consonant as explained below, e.g. KI *igávatuq* 'he is helping' from /ikayuqtuq/ where the third syllable is opened by the deletion of *q*, and the second syllable is subsequently closed by the lengthening of *y* and therefore stressed.

Since stress cannot be said to condition CG and is assigned, rather, after the operation of CG, I speak of "syllable strength" to allow convenient reference to those syllables which will or will not undergo CG. "Syllable strength" is an abstraction whose presence creates a "strong syllable" and whose absence creates a "weak syllable," following which CG can operate to lenite or delete consonants. It is in fact the first syllable of the word which determines the pattern by which CG will apply to all subsequent syllables. "Strong" and "weak" explain the relation of a given syllable to the word-initial syllable, replacing cumbersome expressions such as "not subject to CG" and "subject to CG."

The first syllable of a word is considered strong if it contains a phonetically long vowel—which includes vowel clusters and diphthongs—or is closed, i.e. followed by a consonant cluster or long (geminate) consonant, and weak if it is open, i.e. followed by a single consonant. Weak and strong syllables alternate thoughout the word, from left to right, so that every other syllable is of the same type. This pattern can be interrupted only by a long syllable, i.e. one containing a long vowel or vowel cluster, which always defines a strong syllable.[5]

A consonant or cluster following a weak syllable is then subject to gradation, the result of which depends on the quality of the consonant(s) involved and on the preceding vowel when the consonant is uvular (see below). Word-final consonants are unaffected by CG.

Besides phenomena of lenition and deletion following weak syllables, CG also lengthens single consonants following a strong syllable as mentioned above. Following a word-initial syllable containing a short vowel, there is a contrast between long and short consonants, as in other Inuit dialects. For example, *mannik* 'egg' contrasts with *manik* 'money' or *naniq* 'lamp'. Elsewhere in the word, however, consonant length is governed by CG, and is thus non-distinctive there, unlike the case in other dialects. CG distinguishes Seward Peninsula dialects as the only form of Inuit with a process of automatic consonant lengthening, an otherwise Yupik phenomenon.

For example, underlying /tuttuttuq/ 'he killed a caribou' and /katittuq/ 'he got married' are realized in King Island as [tut:utuq] and [katit:uq], respectively. The single internal *t* in [tut:utuq], although underlyingly double, has become identical to the *t*, which is underlyingly single, in [tut:uta:ga] 'the caribou he killed'. In *sawiti* [sawit:i] 'worker' from /sawiti/, and *sawituq* [sawit:uq] 'he is working' from /sawittuq/, the two *t*'s are indistinguishable from each other. In such cases where consonant length is governed by CG and thus non-distinctive, those segments which are subject to lengthening are not always truly long, precisely because the length feature is redundant. Therefore, where CG predicts a long *t* in *sawiti* and *sawituq*, actual lengthening is in practice optional; where CG predicts a short *t* after a weak syllable, however, e.g. in *aγuvituq* 'he is sitting' from /aquvittuq/, there is no lengthening possible.[6]

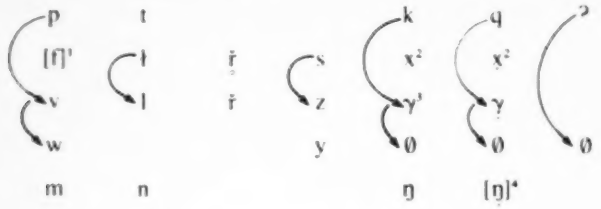
Similarly, following a vowel cluster, a single consonant is automatically long, erasing the contrast between short and long consonants which is possible in this position in other dialects, e.g. *aivatuqtuq* 'he is eating walrus' (cf. NAI *aiviqtuqtuq*) and *aivagtuq* 'he killed a walrus' (cf. NAI *aivvaktuq*). Both contain an equally long *v*, eliminating the contrast found in NAI.

To give a general characterization of the types of changes which occur in CG, stops and voiceless fricatives weaken to voiced fricatives, voiced fricatives weaken to glides or are deleted, and nasals are unaffected. Glottal stop is deleted. These general statements suggest an overall thrust of the system without accounting for a number of details relating to the behavior of particular consonants, especially in clusters. An elucidation of the exact functioning of CG is best accomplished by discussing single intervocalic consonants separately from members of clusters, since weakenings may differ in these two situations. The table below presents a schema of single consonant weakenings.

[5] Counting individual vowel morae in this case does not provide an improved analysis of the behavior of long vowels under CG. If a long vowel or vowel cluster (also phonetically long) is divided into morae, the second mora must be strong so that the following consonant is not subject to CG. A long vowel following a weak syllable, however, should end in a weak mora, if morae are counted, predicting gradation of a following consonant—the wrong result. Of course, it is possible to write an adjustment rule which would say that the strength advances automatically to an adjacent vowel, but this solution seems to buy nothing in this particular case, providing merely an equivalent statement to the one required if vowel morae are not counted, i.e. that long syllables are always strong.

[6] See footnote 7 for an explanation of the policy of the standard orthography.

Table 1. King Island consonants and alternants derived by Consonant Gradation.*



† [f] is an allophone of *v* which occurs in clusters with (voiceless) stops.

* ² Both *x* and *χ* are rare but may occur long or in clusters.

³ *γ* is orthographically *g* in this paper as in the standard orthography.

⁴ [ŋ] is an allophone of *ɣ* which occurs in clusters with nasals.

Beginning with the stops, single *p* weakens to *v* as in *avun* 'snow cover'. Comparison with North Alaskan Inupiaq shows unlenited cognates and gives evidence of the application of CG, e.g. NAI *apun*. Weakening of single *t* produces only a lenis allophone, which is at least partly voiced, e.g. *qitiq* 'middle' (NAI *qitiq*). *k* lenites to *g* [γ], e.g. *igi-* 'to burn' (NAI *iki-*), and *q* lenites to *ɣ*, e.g. *uɣaq* 'tongue' (NAI *uqaq*). As for intervocalic glottal stop, alternation appears to be with zero in weak position, although no cross-dialectal comparison of stems shows this, and I cite examples from inflectional verb morphology, the consequential mood: KI *niɣiʔama* 'when I eat', but *aɣɣiama* 'when I dance', cf. M *niɣiʔama* and *aɣɣiʔama*. The Malimiut forms are of course not subject to CG, and the King Island shows CG only following a weak syllable where ʔ is deleted.

For the voiceless fricatives, *ɬ* and *s* have weakened intervocalic variants, *l* and *z* respectively. (There is no single intervocalic *r̥*.) For example, the postbase /-ɬikuq/ 'remains of, dregs' also appears as both *-ɬiguq* and *-likuq: kuupiaɬiguq* 'dregs of coffee', but *saayulikuq* 'dregs of tea'; and *iziq* 'smoke' shows the weakened form of *s* (NAI *isiq*). Weakened *s* is the only source of *z*, whose synchronic phonological status is taken up below.

* The standard practical orthography for Seward Peninsula Inupiaq uses the same symbols found throughout Alaskan Inupiaq, i.e. *g* for *ɣ*, *ġ* for *χ*, *r* for *r̥*, *sr* for *r̥*, *ł* for *ɬ*, *ch* for *č*, and *ŋ*. Diomede uses *e* for *i* as in Yupik. Special conventions apply to the writing of SPI, however, so that some of the predictable effects of CG may be considered automatic and not written. Consonant length is written, therefore, only when it is distinctive, i.e. at the end of a word-initial short syllable, since short and long consonants contrast here, e.g. KI *manik* 'money' and *mannik* 'egg'. Elsewhere in the word, consonant length is automatically governed by CG as illustrated above, so not written. On the other hand, lenition and deletion are taken into account by the orthography so that consonants which undergo these processes are written in their changed form. In a sense all of CG can be considered automatic, and it would be possible to design a writing system which would include none of the changes produced by CG and consider them all low-level and predictable. In that case [avun] 'snow cover' would be written *apun* as in dialects without CG, with the requirement that literate people know and automatically invoke a rule which changes any single *p* to *v* in this position in a word. If this policy is applied consistently, then [sawik] 'knife' will be written *savik*, since *v* in this position represents [w], although the *v* in *niɣivik* 'am I eating?' would indeed represent [v] because of its position following a strong syllable. Therefore, just in the case of *v* alone we see that the symbol *v* would sometimes represent [v] and sometimes [w], whereas the sound [v] might be represented orthographically as either *p* or *v*. Similarly for consonant clusters, which also alternate because of CG, the surface cluster *gr* could be written as such in *qugruk* 'swan', but would have to be written *kr̥* in a case such as [atigigraq] 'parka material' where it represents a transformation brought about by CG. The complexities are compounded when one tries to figure out how to write the entire language without taking any of the CG changes into account, leaving them all to the user of the orthography. This alternative is deemed too complex and abstract to be practical, since it places heavy demands on readers and writers of the language. The autonomous phonemic level which such a writing system represents is of far greater interest to linguists than to native speakers seeking a straightforward system of written representation for their language.

Of the voiced fricatives, *v* weakens to *w*,[8] e.g. *sawik* 'knife' (NAI *savik*), and *g* is deleted when weak, e.g. *ia-* 'to cook' (NAI *iga-*). The uvular ɣ, like *g*, is deleted, except following the first syllable of the word, where it is retained, however, e.g. *naksiaq* 'practice target' (NAI *naksiɣaq*), but *niɣiřuq* 'he is eating' (NAI *niɣiřuq*).[9]

Consonant deletion may result in sequences of three vowels, which are not permitted in underlying forms, e.g. *igaɣuaa* 'helps him' from /ikayuɣaa/. When deletion produces a sequence of three like vowels, the result is an overlong vowel which is pronounced perceptibly longer than an ordinary long vowel consisting of only two vowel morae, e.g. *qiniɣaaa* 'looks at it with binoculars' from /qiniɣaɣaa/, but *qiniɣaa* 'looks at him' from /qiniɣaa/.

Weakening of single intervocalic consonants was exemplified above by comparison with forms from North Alaskan Inupiaq, which lacks CG. In many of these cases, unweakened alternants of the consonants in question are nonetheless recoverable within the King Island dialect itself, even when stem-internal. Following the initial syllable of the word, a geminate consonant or cluster will define that syllable as strong. The gemination rule (see section 4) may then cause alternants of the above consonants which have not undergone CG to appear as geminates, or they may be retained in clusters with other consonants. For instance, KI *iggan* 'cooking pot' shows the *g* which was said to have been deleted from *ia-* 'to cook'. Similarly, KI *apsruq* (also, *aviruq*) 'it is snow-covered' reveals the *p* whose weakened variant was found in *avun* 'snow cover' (derived from *avi-* 'to be snow-covered', NAI *api-*). Many stems, like KI *kawiq-* 'be red', show no obvious alternation which would yield unweakened consonant variants; in these cases, consonant weakening is known to have applied based on comparative evidence or through the knowledge that the particular segment, e.g. *w* in *kawiq-*, is always derived. As following sections will reveal, however, the suffixation of postbases to different stem types entails highly productive application of CG in differing patterns, creating profuse and complicated allomorphy when compared with the rest of Inupiaq.

2.1 Consonant clusters

Weakening of consonant clusters will be presented first in terms of possible underlying clusters, followed by an explanation of corresponding weak clusters, treated in terms of the place of articulation of the cluster-initial consonant, since entire series behave similarly. Remember that at the end of the first syllable of the word, a consonant cluster or long consonant defines the preceding syllable as strong, and can only weaken elsewhere in the word.

The following statements characterize some of the restrictions on the range of possible King Island consonant clusters and geminates before CG has applied. Earlier phonological rules governing clusters, especially assimilations, are already taken into account by these statements:[10]

[8] In cases where *v* is preceded by *u*, it is not possible to determine whether there is actually a *w* present in the form which has undergone CG, so *puit-* 'swell' from /puvit/ might be *puwit-* but has a vowel identical to that in *uit-* 'open the eyes' from /uit/. In at least one case, *v* is deleted by CG, viz. *iu-* 'form pressure ridges, of ice' from /ivu/. Vowel sequences created by deletion of an intervocalic consonant differ in no way phonetically from original vowel sequences or clusters, cf. KI *ia-* 'cook' from /iga/ and *kia* 'who? (relative case)' from /kia/, where the vowel clusters sound the same, and also the example of *puit-* 'swell' cited above.

[9] An earlier historical consonant gradation process discussed in section 3 eliminated instances of ɣ not preceded by *i*.

[10] Seward Peninsula Inupiaq exhibits the same processes of consonant assimilation described for the Kobuk-Malimiut dialect in Kaplan (1980:37-59). In addition, ɣ regularly becomes nasal next to a nasal, and in clusters of a stop plus a voiced continuant (except *y*), the continuant becomes voiceless, e.g. *pl*→*pɬ* and *qv*→*qf*. If the elements of such a cluster are homorganic, they turn into a single segment, which is a homorganic long voiceless fricative. Thus [tl]→[ɬ:] as in *aɬla* 'another' (cf. M *atla*), and [tɬ]→[ɬ:] as in *itɬi* 'bitter cold' (cf. M *itři*), although *ty* remains. Back stops (velars and uvulars) never cluster with other back stops, even underlyingly, so this rule never applies to them. Although *pv* yields [f:] by this process in Qawiaraq, e.g. [qaf:ik] 'wolverine' (cf. M *qapvik*), the Bering Strait dialects avoid this hapax occurrence of intervocalic *f* and have *qappik* for this form. Also, members of a cluster generally agree in voicing, unless the second consonant is *y* or a nasal as explained below.

1. Any consonant may occur geminate, with the exception of ʔ (and, of course, consonants which exist solely as output of CG, viz. *w* and *z*).
2. Consonant clusters consist of only two consonants.
3. A velar may not cluster with a uvular, and neither may two homorganic consonants cluster, i.e. not **pv, *ts, *lr, *ly*, although *ty* occurs, being phonetically indistinguishable from the cluster ʔ*y*. (*ty* is in some cases derived from a sequence of *t* + *y* while in others it is of uncertain origin.)
4. The only instance when members of a cluster differ in voicing is when a stop is followed by *y* or a nasal. In such clusters, a glottal stop is present between the consonants.

Table 2. King Island Inupiaq Surface Consonant Clusters (not having undergone Consonant Gradation)

pp	pt	pk	pq	p[ʔ]	*[4]	pɬ[1]	pf̬[1]	ps	py[6]			pm	pn	pŋ
tp	tt	tk	tq	t[ʔ]	ʔ[7]	*[4]	*[4]	*[4]	ty			tm	tn	tŋ
kp	kt	kk	*[5]	k[ʔ]	kf̬[1,6]	kɬ[1]	kf̬[1]	ks	ʔ[7]			km	kn	kŋ
qp	qt	*[5]	qq	q[ʔ]	qf̬[1,6]	qɬ[1]	qf̬[1]	qs	ʔ[7]			qm	qn	*[5]
					vv	vl	vf̬		vy	vɣ[1]	vɣ̊[1]			
					lv[1]	ll	*[4]		*[4]	lɣ[1]	lɣ̊[1]			
					f̬v[1]	*[4]	f̬f̬		*[4]	f̬ɣ[1]	f̬ɣ̊[1]			
					ɣv	ɣl	ɣf̬		ɣɣ[6]	ɣɣ	*[5]			
					ɣ̊v	ɣ̊l	ɣ̊f̬		ɣ̊ɣ̊[6]	*[5]	ɣɣ	ŋm[2]	ŋn[2]	*[5]
											mŋ̊[2,3]	mm	mn	mŋ[3]
											nŋ̊[2,3]	nm	nn	nŋ[3]
											*[5]	ŋm	ŋn	ŋŋ
						ɬɬ				ɬx	ɬx			
							f̬f̬							
							*[4]							
								ss						
										xx[6]				
											xx̊[6]			

[1] Following a stop, *v, l,* and *f* are devoiced (see also footnote 10 of text).
[2] See footnotes 10 of text and 4 of Table 1.
[3] This cluster tends to metathesize as explained below.
[4] Absent according to statement 3 above, restricting possible clusters of homorganic consonants.
[5] Absent according to statement 3 above, prohibiting clusters of a velar and a uvular.
[6] Rare. Stop followed by ʔ, *f*, or *v* (except for *ty*) is rare and usually occurs at morpheme boundaries.
[7] Cluster not attested in corpus, although not excluded by any general principle.

The above table lists all the possible consonant clusters of King Island, and suggests with a question mark the occurrence of *tf, ky,* and *qy* although these do not occur in my data. I suspect they may be rare clusters and that their absence is fortuitous. Neither the table nor the preceding statements take into account the tendency of certain King Island (and Diomede) clusters to metathesize according to the following principle: in clusters of voiced consonants only, back consonants (ɣ, ɣ̊, or ŋ) become cluster-initial and apicals (*l* and *f*) become cluster-final. The metathesis can be seen clearly by com-

paring some King Island forms with analogous forms from mainland Seward Peninsula Inupiaq, where the metathesis is not found. For example, for the back consonants, KI *igvit* and SP *ivgit* 'grasses', KI *qituɣnaq* and SP *qitunɣaq* 'son' (with ɣ nasalized by assimilation), and KI *kaŋmit* and SP *kamŋit* 'boots'. Methathesis of apicals is shown in KI *navřaq* and SP *nařvaq* 'lake' and in KI *quvli* and SP *qulvi* 'tear'. Because metathesis occurs in inflected forms such as *kaŋmit* 'boots' and *kaŋmum* 'boot rel. sg.', this process may be considered to function synchronically, unless one argues that such forms have been lexicalized. I have called metathesis a "tendency" because it is not exceptionless, and often fails to occur, especially when it would jeopardize the integrity of a productive and frequently occurring morpheme, e.g. *tigiřvik* 'time or place of arrival' (*tigit* + *vik*) rather than **tigivřik* which would interfere with the common suffix *-vik* 'place of'. The velar nasal fails to metathesize in frequent cases, e.g. KI *qivinŋuzuktuq* 'he is disturbed by noise' (without metathesis of *nŋ*). Metathesis is most common in lexicalized forms and inflected nominals, especially plurals, relative case singular forms and possessives.

The following are some general observations on how the consonant clusters given above change when subject to CG in the King Island sub-dialect (other sub-dialects are considered in section 2.2):

A. Generally, consonants become voiced.
B. Cluster-final consonants lenite like intervocalic consonants, but with the exception of glottal stop, they do not delete.
C. A cluster-initial consonant
   1. deletes if *t*, *ř*, *n*, ɣ, or any uvular. Deletion of a uvular triggers alternation of the preceding vowel as follows: *a* is lengthened, although it becomes only "half-long," remaining distinctively shorter than other usual long vowels; *i* and *u* become (short) *a*.
   2. becomes nasal before a nasal.
   3. becomes a voiced fricative before a voiced fricative (including *ř* or *l*). This rule changes *p* to *v*, *-k* to ɣ, and *q* to ɣ, although *v* is generally realized as a voiced stop before *l*, and ɣ and ɣ are almost always voiced stops when preconsonantal.

Following these general characterizations of changes undergone by consonant clusters, I shall present examples of clusters which have been altered by CG and compare them with clusters which have not, showing how King Island surface forms are transformed by this process, which results in phonological variants of a great number of morphemes in the language. Discussion of examples is organized according to place of articulation of cluster-initial consonants.

Labial-initial clusters follow no special rules, with *p* leniting to *v* as expected, e.g. *-pkun* vialis case 2s and its variant form *-vgun* in *nunapkun* 'through your land' vs. *kuvluvgun* 'through your thumb', where *nuna* 'land' ends in a strong syllable, maintaining the following cluster, but *kuvlu* 'thumb' ends in a weak syllable, following a cluster, and leniting the following cluster. Similarly, *qiniɣivzi* 'I see you pl.' contains the weakened form of the transitive verb inflection *-(ɣ)ipsi* 1s-2p, found unweakened in *igayuipsi* 'I help you pl.' (with intervocalic deletion of weak ɣ, cf. NAI *ikayuɣipsi*). Where CG would create an impermissible consonant cluster, the rule of regressive assimilation, which is present to varying degrees throughout Eastern Eskimo, applies to correct the situation. For example, *niɣipmiuq* 'although he ate' and *aɣɣimiuq* 'although he danced' show allomorphy in the reduction of the *pm* cluster in the second case, where it is subject to CG. Whereas *p* should weaken to *v*, the cluster *vm* is not permitted and is corrected by assimilation to *mm*. As mentioned earlier, etymological consonant length is found only after the first (short) vowel of the word; elsewhere, somewhat lengthened consonants follow strong syllables, except immediately preceding a word-final short syllable.

Of the apicals, *t* and *n* behave differently with regard to CG when cluster-initial from the way they behave when they are intervocalic, since they delete when weakened in the former case but not in the latter. The modalis case forms of *silakuaqsuun* 'airplane' and *suppun* 'gun' show the deletion of weakened *t*: *silakuaqsuutmik* but *suppumik*. Both 'airplane' and 'gun' end in underlying *-utï-* where *ï* is the reflex of *ə and is deletable through the addition of certain suffixes, of which *-mik* is one. Thus, *suppumik* is presumed to be derived from /supputmik/ by CG. Similar deletion affects weak cluster-initial *n*, e.g. *-nŋu-* 'ask for' which gives *niɣinŋuřuq* 'asks for meat' when strong but *atigiŋuřuq* 'asks for a parka' when weak. Cluster-initial *ł* does not weaken, as demonstrated by *-łɣak-* 'do angrily or abruptly', e.g. *aniłɣaktuq* 'goes out abruptly' and *aɣuviłɣaktuq* 'sits down abruptly', where the suffix-initial should be subject to gradation in the latter case. Of the other apical fricatives, *s* and *ɣ* do not occur cluster-initially and *l* and *ř* remain unchanged by CG; *r̥* may not be cluster-initial except in borrowings, e.g. *saaŗ̥kaq* 'teacup' from Russian *čaška*, and shows alternation only cluster-finally, e.g. *-kř̥aq* 'material for', which gives *umiakř̥aq* 'boat material' (*umiaq* + *kř̥aq*) without lenition, but *atigigraq* 'parka material' (*atigi* + *kř̥aq*) where the initial cluster of the suffix is subject to CG.

When cluster-initial, velars behave as they do when single and intervocalic. For example, *k* lenites to *g*: *iɣligvaktuq* 'he is very stingy' from /iɣlikpaktuq/, and *iɣligtuq* 'he is stingy' from /iɣliktuq/, where *t* becomes lenis under gradation. When cluster-initial, *g* is subject to deletion, as in these cases containing *-vik* 'place': *tigliwik* 'place to steal' from /tigligvik/ and *nunivawik* 'place to gather greens' from /nunivagvik/.

When cluster-initial, a uvular weakens by undergoing deletion with a consequent alteration of the length or quality of the preceding vowel. One of the principal areas of phonological variation among the several Bering Strait subdialects lies precisely in the weakening behavior of the uvulars (see section 2.2); the system described here is valid only for King Island.

A uvular-initial cluster preceded by *a* is subject to deletion of the uvular accompanied by a slight lengthening of the vowel. For example, unweakened *amaqtuq* 'puts a baby on her back' contrasts with *igla·tuq* 'laughs' from /iglaqtuq/ and similarly, *amaqman* 'when she put a baby on her back' (different subject) but *igla·man* 'when he/she laughs'. The lengthened vowel produced by this process contrasts with other long vowels in the language, e.g. *saatuq* 'turns to face', and has been called "half-long" and written *a·*. Only *a* can be half-long and all such vowels are the result of a weakened uvular. The vowels *i*[11] and *u* undergo a change in quality, becoming *a*, rather than in length when they precede a uvular-initial cluster subject to CG. *Atuqtuq* 'uses; sings' contrasts with *igaɣatuq* 'helps' from /ikayuqtuq/ and *utiqtuq* 'returns' with *atnatuq* 'is hurt' from /atniqtuq/. Uvular fricatives behave like the uvular stops, e.g. *atuɣlaŋa* 'may I sing' but *igaɣalaŋa* 'may I help' from /ikayuɣlaŋa/. Underlying stem vowels are recoverable when they do not precede an (underlying) cluster, e.g. *igaɣuaa* 'helps him' from /ikayuɣaa/ and *atniaa* 'hurts him' from /atniɣaa/.

2.2 Bering Strait subdialectal variation

Without giving a full exposition of Seward Peninsula dialectology, I shall mention the types of changes which distinguish Bering Strait subdialects from one another. (Qawiaraq, discussed in section 2.4, has a non-productive version of CG, lacking many of the lenitions and deletions described for Bering Strait.) Diomede Inupiaq may be considered to have the most evolved CG system of all, since all back consonants, including velars, may delete, whereas other BS allows deletion only of uvulars. The deletion of back consonants in Diomede leaves no trace of the deleted consonant, producing no alteration in the quality of the preceding vowel as in KI, e.g. D *atnituq* 'he is hurt' from /atniqtuq/, cf. KI *atnatuq*, and D *qappituq* 'he killed a wolverine' from /qappiktuq/, cf. KI *qappigtuq*. The deleted *q* of *atnituq* appears in no related D form and is recoverable only by comparison with other subdialects; the deleted *k* of *qappituq* can be found within D only in the noun *qappik* 'wol-

[11] CG operates here without regard to the historical distinction between the two types of *i*.

verine' since final consonants are of course unaffected by CG.[12]

In the Shishmaref-Wales subdialect, on the other hand, CG is slightly less productive than what has been described for KI and D, containing lexicalized morphemes which do not alternate as expected, e.g. *niɣiruut* 'we are eating' and *aɣɣiruut* 'we are dancing', cf. KI *niɣiruut* and *aɣɣirugut*, where Sh-W fails to show the intervocalic *g* where expected. Shishmaref-Wales also shows differences from other BS in the effect which deletion of a cluster-initial uvular has on a preceding vowel. We have seen that in KI *a* becomes *a·*, and *i* and *u* become *a* when a following uvular is deleted by CG, and that in D a vowel in this situation is unchanged. In Sh-W, *i* becomes [e:], e.g. *iglaituq* 'he is traveling' from /igliqtuq/, *u* becomes [o:], e.g. *igayautuq* 'he is helping' from /ikayuqtuq/, and *a* becomes [a:]—indistinguishable from other long *a*—e.g. *iglaatuq* 'he is laughing' from /iglaqtuq/. Also, intervocalic ɣ does not delete in Sh-W as it does in KI and D, e.g. KI, D *atqain* 'go down!' 2s but Sh-W *atqaɣin*.

One effect of the consonant deletions triggered by CG is to create vowel sequences which are generally prohibited in Eskimo languages. In KI deletion of a preconsonantal uvular following *a* creates a so-called half-long *a*, distinct from both *a* and *a:*. Deletion of an intervocalic back fricative next to a long vowel in KI or D may create an overlong vowel (see also section 2.0), as in KI *qiniɣaaa* 'he is watching it through binoculars' from /qiniɣaɣaa/ or an overlong diphthong as in KI *igayuaa* 'he is helping him' from /ikayuɣaa/ or D *tegleaa* 'he stole it', where KI retains the *g* in the equivalent form *tigligaa*. Normally in Eskimo languages, schwa (or its Inupiaq reflex *i*) cannot occur long or in a cluster with another vowel, but in Diomede both are possible as evidenced by *tegleaa* above and *Keegen*, the Diomede name for Cape Prince of Wales.

Table 3. Subdialectal variation in the Bering Strait Consonant Gradation process.
(North Alaskan Inupiaq forms undergo no sort of CG. Phones and sequences of phones in the NAI column are matched in other columns by corresponding segments which have undergone CG, with actual examples in the following line.)

	North Alaskan Inupiaq	King Island	Diomede	Shishmaref-Wales
1.	k	g	Ø	g
	paamaktuq	*paamagtuq*	*paamatuq*	*paamagtuq*
	'he is crawling'			
2.	ɣ	Ø	Ø	ɣ
	atqaɣin	*atqain*	*atqain*	*atqaɣin*
	'go down!' 2s			
3.	aq'	a·	a	a:
	iglaqtuq	*igla·tuq*	*iglatuq*	*iglaatuq*
	'he is laughing'			
4.	iq	a	i	ai [e:]
	igliqtuq	*iglatuq*	*iglituq*	*iglaituq*
	'he is traveling'			
5.	uq	a	u	au [o:]
	ikayuqtuq	*igayatuq*	*igayutuq*	*igayautuq*
	'he is helping'			

[1] Correspondences for Vq sequences apply also to Vɣ.

2.3 Suffix allomorphy and the abstractness problem

Up to this point, I have made use mostly of stems to illustrate the possible types of lenition

[12] Diomede also shows deletion of at least one intervocalic instance of ŋ in *Keegen* or *Keekti*, the name for Cape Prince of Wales, which is *Kiŋigin* or *Kiŋikti* in all other Inupiaq. The Diomede form remains somewhat mysterious, since the verb stem from which it is ostensibly derived, *keŋek-* 'to be high', retains the ŋ, making this place name exceptional.

and deletion which occur under CG, with inflected stems often serving to demonstrate the alternate syllable principle. In fact, it is in postbases that one finds the sort of regular and consistent alternation which is responsible for the profuse allomorphy which is the most remarkable characteristic of Bering Strait phonology.

Consider a denominal postbase of the truncating type, *-qaq-* 'have':

manniɣaqtuq	'it has an egg' /mannik + qaq + tuq/
naniqa·tuq	'it has a lamp' /naniq + qaq + tuq/

The two allomorphs *-ɣaq-* and *-qa·-* do not share a single consonantal segment, and yet both are derived predictably from *-qaq-* according to the rules of CG. Since one *q* or the other will always be subject to CG, the full form of the morpheme never appears in surface forms.

A more complex example of suffix allomorphy is furnished by *-pałak-* 'do much, to excess', which exhibits the weakening of all three of its consonants. The allomorph *-vałak-* is regularly found following vowel-final stems, and this further complicates the picture, since sometimes p/v alternation is due to CG, while at other times it is the result of intervocalic position regardless of the CG rule.[9] Verb stems are shown in parentheses.

niɣivalakpa (*niɣi-*)	'did he eat much?'
aɣɣiwałagva (*aɣɣi-*)	'did he dance much?'
qaniqpalakpa (*qaniq-*)	'did he talk much?'
igla·vałagva (*iglaq-*)	'did he laugh much?'

The possible allomorphs of *-pałak-* are thus *-valak-*, *-wałag-*, *-palak-*, and *-vałag-*, with *w* being the weak alternant of *v*, which is found with vowel-ending stems as explained above.

The process of consonant weakening is at its most regular in the King Island dialect as set forth here. Almost all consonants alternate as predicted by the system, although a few exceptions occur. For example, CG produces syncretism in possessed forms like *illua* 'my *or* his cross-cousin', where 'my cross-cousin' is underlyingly /illuġa/ from the stem *illuq*, with predictable deletion of ɣ following a strong syllable, cf. *qaniɣa* 'my mouth' from the stem *qaniq* where ɣ is not subject to deletion. A case of ɣ failing to delete in the expected position occurs with the diminutive suffix *-uřaq*, which always yields *-uřaɣa* when inflected for a 1s possessor, and never **-uřaa* as CG would predict. Attached to the stem *illuq* 'cross-cousin', this suffix gives *illuuřaq* and, with the 1s-3s possessed ending, *illuuřaɣa* 'my cross-cousin (diminutive)'. According to the rules, we expect *ř* to be strong following the long syllable and ɣ to be weak and subject to deletion, giving **illuuřaa* (which, however, occurs only with the meaning 'his cross-cousin'). This irregularity of *-uřaq* appears consistently, even in King Island.

The writing of underlying forms for Bering Strait Inupiaq poses interesting problems in terms of phonological abstractness. If one intends to limit the degree of abstractness in underlying forms, it becomes necessary to sort out phonological changes which can be considered diachronic processes whose history is not to be recapitulated in the rule system of the modern language. Since a most prominent type of phonological rule in the language is CG, it must be asked whether CG may be considered a synchronic rule which acts upon underlying forms or whether the changes—or some of the changes—resulting from CG are in some way lexicalized and already present underlyingly, attributing a historical status to CG, or some parts of it. I maintain that CG is a synchronic rule of Bering Strait Inupiaq and that underlying forms should be written so that the application of CG will account for the alternations described above, admitting the possibility of separating CG into different parts, only some of which are synchronically viable.

[9] The intervocalic p/v alternation is in fact due to an earlier consonant gradation found throughout Eastern Eskimo and discussed below in section 3.

Allowing CG to apply to underlying forms has the effect of expressing in phonological terms the highly regular relationship between variant forms of single segments whose appearance is also conditioned phonologically. For example, both the ɣ of *-ɣaq-* and the lengthened vowel of its alternate form *-qa··* 'have', will be shown to reflect an underlying *q* (from /qaq/), as is the case for many instances of ɣ and all instances of *a·* throughout the language. The appearance of one form of the morpheme or another is governed by the relationship to the word-initial syllable, which according to CG is weak or strong. While this approach has the advantage of predicting which morpheme variants will occur in which position in the word, it has the disadvantage of creating underlying forms that are morphological abstractions, e.g. /qaq/ which never surfaces as such but is always transformed, appearing as either *-ɣaq-* or *-qa··*. A possible concrete alternative is to write a lexical statement relating the forms *-ɣaq-* and *-qa··*, without saying that they are derived from a single common form, which someone might argue is true only historically. This morphological solution fails to capture the generalization of the frequent and regular alternation of intervocalic *q* with ɣ and of preconsonantal *aq* with *a·*. Any solution would still have to refer back to phonological information in order to predict the occurrence of morpheme variants by looking again at whether the word-initial syllable is open or closed.

One of the strongest arguments for a phonological solution to the CG question lies in the regular and highly predictable nature of the process. Although CG is not exceptionless, even in KI where it exceptionally fails to apply when it would produce homonymy in possessive forms as shown above, its operation on recent loan words is convincing evidence of its current viability. For instance *pizziq-* 'to be busy' is treated like any other KI stem for purposes of CG, giving *pizzatuq* 'he is busy' with the deletion of *q* and transformation of *i* into *a* as expected, even though long *z* does not occur normally, signaling this as an odd form, although normal for purposes of CG. *Pikniq-* means 'to picnic' and can also be inflected and derived in a regular manner, e.g. *pikniaqtuut* 'we (habitually) picnic' from /pikniɣaqtugut/.

Accepting CG as a synchronic phonological process which accounts for observable alternations still does not answer the question of how to handle segments which are clearly derived by CG but which have no alternation, e.g. *izuma* 'mind' (NAI *isuma*), which shows no alternation in Bering Strait, giving no internal justification for deriving it synchronically from *isuma*, except for our knowledge of the operation of CG, which tells us that *z* is always derived from *s*, and comparative evidence which shows *s*, e.g. NAI *isuma*.

Non-alternating segments must be considered underlying if one takes a concrete approach to phonology, and in cases like *izuma*, what distinguishes derived occurrences of a segment from underlying ones is essentially their position in the word. There is no alternation of *z* in *izuma* because a consonant following an initial short syllable defines the pattern of CG alternations rather than being defined by it, and also because the position of *z* in this case exempts it from morphophonemic processes, such as gemination, which also produce phonological alternations, cf. *iziq* 'smoke' and *issit* 'smokes pl.', where gemination in the plural gives the regular long variant of *z*, which is [s:].

The possibility of separating CG into two parts— a synchronic one which applies to underlying forms to yield the alternations observable in modern BS, and a diachronic one which operated at an earlier stage than that represented by underlying forms—entails a discussion of the effect of different solutions on the underlying phonemic inventory. The most abstract solution to the problem gives the most economical underlying inventory, so that if CG is considered a unitary synchronic process which has not operated on any underlying forms, the inventory of phonemes will not include the segments *z* and *w*, which will result only from CG. If one posits all non-alternating segments underlyingly, however, as proposed for *izuma*, *z* will occur both as a derived and an underlying segment. Similarly, for a stem like *iwalu* 'sinew', a case can be made for positing *w* underlyingly, since it fails to undergo any alternation with *v*, even though it certainly derives from a *v*, at least historically (cf. NAI *ivalu*). If CG is allowed maximal application, and *iwalu* is /ivalu/ and *izuma* is /isuma/, then *w* and *z* can be omitted from the underlying inventory of phonemes and considered only derived.

For vowels, CG will predict all instances of *a·* and of overlong vowels and diphthongs, e.g. *aaa*, *iii*, *iaa*. These vowel lengths all result from CG at some level, and non-alternating instances of them are quite rare, since they must follow a strong syllable, making them nearly always stem-final or else part of a suffix which undergoes regular alternation; therefore, the question of whether these vowel lengths may appear underlyingly is almost moot. But assuming there exists the odd instance of stem-internal *a·*, it would be problematic not to derive it by CG and thereby necessitate its inclusion as an underlying segment. The case of CG thus provides an example of rich and productive allomorphy in a polysynthetic language, which creates difficulties of phonological abstractness when one tries to judge productive versus non-productive applications of CG, using the criterion of productivity to decide what may appear underlyingly and thereby dividing up CG, which is, according to other indications, a unitary process.

I have argued that CG must be considered a synchronic process, at least when it creates alternation, but a ramification of this approach is that it allows many segments to undergo partial neutralization when they are altered by CG. For example, of instances of [a] in King Island, some are underlyingly *a* but others derive by CG from sequences of *iq* or *uq*, although all are indistinguishable from each other in surface forms. Thus, of the four phonetically identical *a*'s in KI *aŋatkanaq* 'partial shaman', the third one is derived from *uq* in /aŋatkuq + naq/. While the second syllables of *aɣnamun* 'to the woman' and *aivamun* 'to the walrus' appear quite similar as to their vowels, the NAI forms *aɣnamun* and *aiviɣmun* show that CG has applied in the second instance to transform *iɣ* into *a*. Similarly, identical consonant clusters may reflect different clusters underlyingly if CG has applied, so that the *gř* of *qugřuk* 'swan' is from /gɬ/, whereas the *gř* in *atigigřaq* 'parka material' is derived by CG from /kɬ̥/, cf. NAI *atigikɬ̥aq*.

2.4 Qawiaraq

In all Bering Strait subdialects, CG governs regular allomorphy in the postbases and is always quite productive. The Qawiaraq dialect, however, shows little allomorphy due to CG, having generalized most of the lenitions and deletions present, thus illustrating an unproductive version of the system.[14] Sometimes *g* deletes, e.g. Q *kiun* 'tooth' (NAI *kigun*) but Q *iga-* 'to cook' (NAI *iga-*, but KI *ia-*).[15] *g* is retained, e.g. Q *niɣi-* 'eat' (NAI *niɣi-*) and Q *assiɣaa* 'named him' (NAI *atchiɣaa*, but KI *assiaa*). Unlike BS, *s* does not become *z* , e.g. *pasi-* 'blame' (KI *pazi-*). Qawiaraq postbases and inflections show almost no allomorphy due to CG, so that *-qaq-* 'have', discussed earlier as having two allomorphs, *-qa·-* and *-ɣaq-*, for King Island, is invariably *-qaq-* in Qawiaraq. Similarly, *-łiuq-* future has the allomorph *-liuq-* in King Island when the initial consonant is subject to CG, but not in Qawiaraq. The postbase *-gi-* 'have as' shows some allomorphy due to CG, but not of the predictable sort found in KI, e.g. from *aaka* 'mother' we get *aakaigiga* 'she is my mother' (cf. NAI *aakagigiga* and KI *aakaigia* with regular deletion of alternate occurrences of *g*). But Qawiaraq also has the alternate form of the same word *aakagiiga*, which shows deletion of an intervocalic *g* not predicted by the CG rule and probably analogical to forms like Q *inigiiga* 'it is my house', which is also KI.

An example of the generalization of a change effected by CG is the use of *-łuu* as the only form of the 3s-3s subordinative ending (whereas in Bering Strait *-łuu* alternates with *-ługu*), e.g. Q *tiglikłuu* 'he, stealing it', which is NAI *tiglikługu* and KI *tigliglugu*. Where the full CG system weakens the *kł* cluster and retains the intervocalic *g* as in KI, the cluster fails to weaken in Q and is followed

[14] Data are for Southern Qawiaraq as spoken at Unalakleet. Of the stops, only *q* lenites, e.g. *apun* 'snow' (not **avun* as in KI), *iki* 'wound' (not **igi*), but *niɣi* 'meat' (KI *niɣi* and NAI *niqi*). Voiced fricatives lenite differently in Qawiaraq from Bering Strait, with *v* changing to *w* or undergoing deletion, e.g. *sawik* 'knife' (NAI *savik*), but *ialu* 'sinew' (NAI *ivalu*, cf. KI *iwalu*).

[15] I have not yet determined what factors influence retention or deletion of *g* in Qawiaraq, since /tigu/ goes to *tiu-* 'take hold of' and /igit/ goes to *iit-* 'throw away', but /iguk/ remains *iguk-* 'suck'. It is my suspicion that some of the inconsistency is due to the influence of the Malimiut dialect, which lacks CG, on Southern Qawiaraq.

by *-ɬuu*, which has become generalized so that it no longer alternates with *-ɬugu* as in KI. The generalization of *-ɬuu* is based on forms like KI and Q *amaqɬuu* 'putting him (baby) on her back', where the *qɬ* cluster and the deletion of *g* from the ending are in accordance with the full, productive CG system.

The process described for King Island by which single consonants become fortis after a strong syllable also applies in Qawiaraq, even in final syllables, so that the ŋ in *aɣɣiřuŋa* is decidedly longer than the *ř* and nearly equivalent in length to the ɣ.

Spoken at the head of Norton Sound, Southern Qawiaraq is in closest proximity to Yupik of any Inupiaq dialect and indeed shows a great deal of Central Yupik influence in terms of borrowings and words which get restructured phonologically, e.g. *qilaaŋaq* 'puffin' for some Qawiaraq speakers with CY-style rhythmic vowel lengthening, while others retain *qilaŋaq*, the usual Inupiaq form of this word. Similarly, the adjacent Unaliq dialect of Central Yupik has adopted Inupiaq words, e.g. *aařigaa* 'nice!', complete with the very un-Yupik *ř*. Now these similarities are obviously quite superficial and probably result from recent contact between the languages at the borderland.

However, there is a far more profound feature held in common by all Seward Peninsula Inupiaq and Yupik: all Yupik languages have a prosodic system and SPI has the Consonant Gradation system, which is intimately related to the prosody of Unaliq Central Yupik, making SPI resemble Yupik more closely—at least superficially—than does any other form of Inuit. To review, Unaliq has stress on initial closed syllables and on long syllables (long vowels or vowel clusters), with alternating syllable stress thereafter. Seward Peninsula Inupiaq has syllable strength precisely where Unaliq has stress, so that the abstract feature of strength can be assigned by the same principle as Unaliq stress. That CG follows the Unaliq pattern and not the prosodic pattern found in General Central Yupik (GCY)—which includes a regressive stress rule—is shown by the following example: CY *aɣnaxpani* 'his own big woman' is stressed as [áɣnaxpáni] in Unaliq (with lengthening of *a* in the third syllable) and [áɣnáxpani] in GCY, with regressive stress. In the same word in Seward Peninsula Inupiaq, strong syllables correspond to the stressed syllables of Unaliq and not those of GCY: KI [áɣna·váni], not *[aɣnaqpani] (NAI *aɣnaqpani*).

Whereas all forms of Yupik have prosodic systems, Seward Peninsula is the only Inupiaq dialect with a synchronic consonant gradation system, and this system appears closely related to the prosody of the immediately adjacent Unaliq dialect of Central Yupik. It seems clear, therefore, that the existence of CG is due to contact with Yupik. In this type of situation, one is led to expect that bilingualism among a large part of the population is responsible for bringing influence from one language into the other. The circumstances which brought about this language contact are, of course, difficult to reconstruct, but the linguistic facts strongly suggest where earlier language boundaries might have been. We know, in any case, that Yupiks lived much farther northwest along the shore of Norton Sound a century ago than they do today.

Although any reconstruction of the historical situation which allowed Yupik prosody to penetrate Seward Peninsula Inupiaq will depend to some extent on guesswork, it is important to notice that the Yupik prosodic system which correlates with Seward Peninsula consonant gradation is clearly not of the Siberian type, which lacks closed initial syllable stress, notwithstanding the fact that the Bering Strait dialects have in recent times had their closest contacts with Siberian Yupik and especially Naukan. In fact, Bering Strait Inupiaq is not now in contact with Central Yupik, since Southern Qawiaraq and Southern Malimiut intervene, and yet Bering Strait retains the best defined and most productive version of consonant gradation, suggesting an earlier language picture very different from that found today.

The best hypothesis is that the entire southern shore of Seward Peninsula was once Yupik, including Cape Prince of Wales and the Bering Strait area. This language configuration would provide the crucial link between Alaskan and Siberian Yupik, making Bering Strait Inupiaq the new element, which must have intruded from the north and become strongly influenced by Unaliq in the process. This of course includes the possibility that Bering Strait Inupiaqs were originally Unaliq speakers

who learned Inupiaq, which became affected by their Yupik prosodic system. As for Qawiaraq, it must have arrived later on the scene, driving a wedge between Bering Strait Inupiaq and Unaliq, and ending the direct contact between them. The likelihood of this scenario is supported by the relatively superficial nature of Central Yupik influence on Qawiaraq: *č* replaces *s* in the Fish River dialect, CG is only incipient in nature, and lexical borrowings and Yupik-like vowel lengthenings are found in the southernmost Qawiaraq, resulting from recent contact with Yupik since the time when Qawiaraqs moved to Unalakleet.

Besides the influence that Yupik prosody had on Inupiaq, it is worth noting that the lenis/fortis consonant alternations which Jacobson describes in his article in this volume (section 3.3) for Unaliq appear to be due to Inupiaq influence, since they resemble the consonant gradation process of neighboring Inupiaq dialects, with lenis variants occurring where CG would apply in Seward Peninsula Inupiaq.

A further question arises of what relationship Qawiaraq Inupiaq has to the other languages and dialects of the area. Although it is today in direct contact with Unaliq and there are many people who speak both, Qawiaraq's non-productive version of consonant gradation gives the impression that it has actually had less profound contact with Yupik than has Bering Strait with its elaborate CG system. The assumption which allows one to suppose greater Yupik influence on Bering Strait is that Qawiaraq's version of CG is actually incipient or representative of partial diffusion of elements of the BS system and is not a vestigial version of the full system. Had Qawiaraq once had a productive CG system, many of the consonants which would have been changed would become quite difficult to recover in their original form to give the undeleted, unlenited consonants found in present-day Qawiaraq. Suffix allomorphy due to CG usually allows for easy recovery of underlying consonants without looking outside the dialect, i.e. unchanged consonants are present in one allomorph or another. In stems, however, the task is more difficult, so that the *p* which underlies the *v* in BS *avun* 'snow' is unlikely to be recovered once a dialect has adopted the full CG process and changed *p* to *v*. Since Qawiaraq has the form *apun* for 'snow', I assume that it was never *avun* here and that the dialect never had the full process of CG as found in Bering Strait.[16]

3. Yupik prosody and Seward Peninsula Consonant Gradation

To this point I have described the facts of consonant gradation and speculated as to how a prosodic system affected an Inupiaq dialect. Considering Eskimo as a whole, prosody based on alternate syllables appears distinctively Yupik; consonant gradation as a result of prosodic alternation, however, does not. Only Unaliq Yupik with its fortis/lenis voiced fricative alternations has anything resembling CG and may have borrowed this system from Inupiaq. Consonant gradation does, on the other hand, fit well within the Inupiaq scheme of things, as I will show below, making the system something of a hybrid: Inupiaq consonant alternations motivated by a process resembling Yupik prosody.

One of the phonological innovations of the Inuit branch which defines the split from Yupik is an old Consonant Gradation system discussed originally by Ulving (1953) and later by Kaplan (1982a). Comparison of Inuit consonants with those of Yupik shows that the former have undergone a series of regular changes, which still are recoverable language-internally to some extent. In the first step of the process, stops are found to lenite to voiced fricatives except following an initial (open)

[16] When I show that Qawiaraq does not have the full CG system, lacking lenition of *p*, for example, and claim that this proves CG is incipient and not vestigial in this dialect, I must also assert that Qawiaraq did not once have the full system and later "undo" its effects by recovering full consonants through contact with other languages, viz. Central Yupik, or Inupiaq dialects, viz. Malimiut. At the original location of Qawiaraq on the Seward Peninsula near present-day Teller, whence the Unalakleet area Qawiaraqs moved within the past century, this dialect was in contact with the Bering Strait group, which exhibits the full CG process, and not with either Malimiut or Yupik. If anything, CG should have been reenforced in Qawiaraq by the neighboring dialect. In any case, it seems highly improbable that the dialect would reverse all the cases of *p* changing to *v* and none of those where *q* is lenited to *γ*, especially since no other dialect lenites only *q*, and there is thus no model to influence Qawiaraq in this direction.

short syllable. The cognate pair CY *tulukaɣuk* 'raven' and I *tulugaq* 'raven' show lenition of *k* in the Inuit form, with the original stop retained only when geminate, cf. I *tulukkat* 'ravens pl.'. Similarly for *q*, the pair CY *anuqa* and I *anuɣi* 'wind' shows lenition of the uvular stop in Inuit which again reappears when geminate, cf. I *anuqqaktuq* 'it is becoming windy'.

The second step of the historical consonant gradation deletes single intervocalic (underlying) voiced fricatives, which survive in Inuit, again principally as geminates. Deletion of a fricative is evident in the pair CY *tugeq*, I *tuuq* 'ice chisel', and cf. I *tuggut*, the plural form where the original fricative is present as a geminate. Deletion of a uvular fricative is evident from the alternation in the Inuit forms *qaiřuq* 'he came' and *qaɣɣain!* or *qaɣɣiin!* 'come! sg.', even though there is no Yupik cognate.[11]

I have suggested an additional level of gradation (Kaplan 1982a) which takes non-rule-governed geminate stops, e.g. those which arise through suffixation, to single consonants. For example, I *kammaka* 'my boots dl.' from *kammak* 'boots dl.' + *-ka* 'my'. Here the expected geminate is simplified to a single *k* and contrasts with *kamiga* 'my boot', where *g* has been lenited from the single *k* of the possessive ending by the historical consonant gradation process, cf. CY *kamguuxka* 'my boots dl.' and CY *kamguka* 'my boot', containing the morphemes *kamguk* 'boot', *-k/g* dual, and *-ka* 'my'.

The similarities between Seward Peninsula Consonant Gradation (SPCG) and the old Inuit Consonant Gradation (ICG) appear numerous and suggest a historical relation between the two. Their differences, taken up below, still do not discount the possibility of a relationship. ICG was not iterative in its operation and applied only to underlying consonants, never to its own output. SPCG appears to be a second pass of the old ICG system, which having been brought back with some modification and applied productively, now applies to the Inupiaq consonant system, i.e., the output of historical ICG.

Comparing ICG with SPCG, one finds that the latter is far more productive—at least synchronically in Bering Strait dialects—and works extensive changes. Of major importance is the fact that SPCG eliminates the provision that stops do not lenite following an initial short syllable, so that *iki-* 'burn' becomes *igi-*. The only remnant of a distinction between initial syllables and others is found in the case of single ɣ which fails to delete in this situation, e.g. NAI *niɣi-* → KI *niɣi-* 'eat', but NAI *naksiɣaq* → KI *naksiaq* 'practice target'. SPCG has *w* as a weak form of *v*, not found in ICG, but fails to show alternation between *t* and *ř* or *ř* and ∅ as in ICG. Further, SPCG does not allow the presence of *i* (the modern Inupiaq reflex of *ə) to affect the environments which produce consonant alternations, where an adjacent *i* will prevent deletion of a fricative under ICG (see below and Kaplan 1981:193-205 and 1982a:389-390).

Having shown how the Seward Peninsula consonant gradation system relates to the old Consonant Gradation rule found throughout Inuit, I shall situate this problem within the overall context of Eskimo. Whereas only the Inuit branch shows several degrees of gradation in consonants, Yupik has deletion phenomena which are probably related to the more elaborate Inuit system. I refer here not to the consonant truncations triggered by suffixation, but to intervocalic deletions which may or may not be morphophonemically conditioned.

The Siberian Yupik languages have intervocalic fricatives not found in Alaskan Yupik, and these generally represent historical consonants of Proto Eskimo by all evidence. Sirenikski is by far the most conservative of all Eskimo languages in terms of consonant retention, with its instances of *c*, reflex of Proto Eskimo **r̄* (or **z̄* in some reconstructions), which is lost in most Yupik, e.g. Sir. *kucəx* 'river', SLI *kiik*^{w}, CY *kuik*, but I *kuuk*, with intervocalic *r̄* surfacing as a geminate or in a cluster, cf. I *kuřřak* dl. from Proto Inupiaq *kuřək. SLI retains instances of intervocalic *g* and ŋ

[11] In some cases a deleted fricative is not recoverable within Inupiaq, e.g. CY *aɣu-* and I *au-* 'to rot', where no uvular ever appears in any related Inupiaq form. In fact, where gemination applies and should cause the deleted fricative to reappear, Inupiaq generalizes a *g* when the historically correct consonant has been lost, giving in this case *aggun* 'corruption, rot', rather than **aɣɣun* which we are given to expect from comparison with CY (see also Kaplan 1981:182-188).

which are often deleted on the Alaskan mainland, e.g. SLI *sigun* 'ear', CY *ciun* and I *siun*, or SLI *pagunɣaq*, CY and I *paunɣaq* 'crowberry', and for ŋ, SLI *nunaŋa* 'his land', CY *nunii*, I *nunaa* or *nunaŋa*.

Yupik consonant deletions involve primarily the back fricatives ɣand ɣ, as well as *ʁ and ŋ. Deletion of ʁ must be considered a historical process. (In a cluster, *ʁ may be reflected by z—or ɣ in Hooper Bay-Chevak—and intervocalically by ∅or ɣ.) Deletion of velars and uvulars, however, is often morphophonemically conditioned through suffixation and results in allomorphy which evidences alternation of C and ∅. For example, CY, I *ui* 'husband' has lost a velar which is internally non-recoverable but present in SLI *ugi;* however, the ŋ of the 1s intransitive indicative ending is recoverable within Central Yupik where it normally deletes, e.g. *qavaɣtua* 'I am sleeping' but *qavaɬɣuuŋa* 'I slept'. Without indulging in extensive exemplification and argumentation which can be found elsewhere (Reed et al. 1977:25-26), the environment for velar (and uvular) deletion in Central Yupik can be described as follows: deletion of a single ɣ, ɣ, or ŋ will occur between short vowels, neither of which is ə. In St. Lawrence Island, the process applies only to ɣ, cf. *qavaamaaq* 'is asleep' from *qavaɣ-* (*qavaɣ-* + *-uma* with vowel cluster assimilation following deletion of ɣ) but *tupagumaaq* 'is startled' from *tupag-* + *-uma*. In any case, the environment for fricative deletion under the old Inuit Consonant Gradation system is the same.

Single intervocalic voiced fricative deletion, then, is a widespread phenomenon of Eskimo; the innovation of Inuit is to expand the process to a multi-tiered system affecting geminate and single stops as well as fricatives. An innovation of Alaskan Yupik seems to be the extension of velar deletion to ŋ, which is retained in Siberian Yupik as in Inupiaq.

It is my goal to trace the origins of Seward Peninsula Consonant Gradation back to Proto Inuit and suggest a relationship with Yupik which may shed light on Proto Eskimo. Simply put, the deletions we have treated yield vowel clusters or long vowels and are a primary source of these. (Throughout Eskimo are also found vowel lengthening rules, e.g. in Inupiaq duals and vocatives.) Without the deletions treated here, Proto Eskimo certainly had few, if any, morpheme-internal long syllables. This point is further evident when one looks at the relic Sirenikski Eskimo language spoken now by only two people in Sireniki on the south coast of the Chukchi Peninsula in Siberia. Sirenikski retains many of the Proto Eskimo intervocalic consonants which were dropped in other languages yielding long vowels, e.g. Sir. *acəx* 'blood' (CY, I *auk*), Sir. *kucəx* 'river' (CY *kuik*, I *kuuk*).

4. Historical implications

Since the prosody-related consonant gradation process has led to a discussion of gradation and deletion of consonants in Inuit, and in Eskimo more generally, it seems relevant here to take up the subject of gemination, which obviously interacts with the prosodic systems. The phenomenon of gemination has long been considered an important one for Eskimo; recently, gemination phenomena have been discussed by Ulving (1953), Rischel (1974:280-300), and Kaplan (1981:221-268), and from a historical perspective by Jens Elmegård Rasmussen (1979). While all this earlier work is quite germane to the present examination of the issue, I will attempt here only to touch on some of the critical points and conclusions, making no attempt at a full exploration of the subject.

Essentially, Inuit gemination appears more complex, less predictable, and very different from the gemination found in Central Yupik. I intend to present the Inupiaq evidence, discuss its relationship to prosodic-type systems, and finally look at Central Alaskan Yupik gemination to see if any fruitful comparisons with Inupiaq can be drawn.

There are several different types of Inuit gemination, and they vary in their importance to the types of problems to be discussed here. Most gemination, especially from the Alaskan North Slope eastward, results from consonant assimilation applying to clusters either morpheme-internally or across morpheme boundaries as a result of suffixation. Here I shall look rather at less transparent geminates which appear to be either underlying or else rule-derived from a single consonant by a

process I shall call "true gemination."

Etymological stem-internal geminates, i.e. those which are neither assimilated clusters nor rule-governed, are fairly rare. I have suggested elsewhere (Kaplan 1981:221) that *mannik* 'egg' is an example of such a geminate, but now find that the Diomede and Naukan form *manŋiq* implies an original cluster. Otherwise, *unnuk* 'evening' and *illuq* 'cross-cousin' have stem-internal geminates found throughout Inuit, cf. CY *unuk* and *iluq* along with *manik*, which shows loss of a probable cluster. The geminates in the Inuit forms do not result from the regular gemination process discussed below. It is possible that they are original geminates which have been lost in Yupik. Besides stems, postbases show some geminates, e.g. North Slope *-qqayaq-* 'almost' and *-qqaaq-* 'first'. Geminates of this type must have been present in Proto Inuit, while others are the result of regressively assimilated consonant clusters, e.g. NS *qimmiq* 'dog', cf. M *qipmiq*, or at a morpheme boundary NAI *aqpanniaq-* 'run, future' from /aqpat + niaq/. With the possible exception of a few marginal examples, progressive assimilation does not yield geminates (see Kaplan 1981:57-59 and 70-73). The only cases of true Inupiaq gemination with any synchronic transparency are those which are conditioned by suffixation, i.e. a single stem-internal consonant alternates with a geminate in the presence of one of a category of postbases and inflections. These morphemes which trigger gemination must, in modern Inupiaq grammar, bear a special marking to indicate this fact, since phonological motivation is synchronically lacking. For example, *iga-* 'cook' + *-vik* 'place' yields *iggavik* 'kitchen'. *Igavik* 'am I cooking?' derives from *iga-* + *-pik* 1s interrogative and shows no gemination.

Rischel (1974:197-300) argues for gemination as a process of compensatory lengthening, whereby the loss of a syllable—or part of a syllable—produces gemination of a preceding single consonant. Certain West Greenlandic doublets illustrate this situation neatly: *igaffik* and *iɣɣavik* 'kitchen' (1974:287) show a reciprocal relationship between a geminate in the suffix in one case and in the stem in the other (with predicatable devoicing of geminate continuants). Scanty evidence survives in Eskimo of the fact that *-vik* was once cluster-initial. West Greenlandic, with its extensive regressive assimilation, points to -C*vik*, and the Bering Strait dialects furnish confirming evidence showing *-ŕvik* and its variant *-vik*, which yield the KI doublet *iggawik* and *iaŕvik* 'kitchen', corresponding precisely to the Greenlandic doublet *iɣɣavik* and *igaffik*. Similarly then, NAI *niɣɣiñak* 'don't eat!' from *niɣi-* 'eat' + *-nak* 2s negative imperative suggests that gemination may be due to the simplification of a suffix-initial cluster as was the case with *-vik*. North Alaskan Inupiaq contains clues that the original form of this suffix might have been -C*nak* (see Kaplan 1981:260), and this suspicion is again confirmed in Bering Strait, cf. the KI doublets *niɣɣinak* and *niɣitnak* 'don't eat!'.

The cases discussed above show a relationship between successive syllables; when a syllable is opened by cluster simplification, a previous syllable is closed by gemination, so that -CVCC- becomes -CCVC-. With the exception of Seward Peninsula Consonant Gradation and Schneider's Law, this phenomenon is as close as Inupiaq comes to a prosodic process of the sort found in Yupik, relating adjacent syllables. Other instances of gemination can also be viewed as resulting from the simplification of a cluster later in the word, including those found in plural nouns, such a I *ammit* 'skins' where suffixation of the plural morpheme *-t* to the singular noun *amiq* yields a cluster whose simplification is mandatory, being word-final (see also Kaplan 1981:222, 234, Bergsland 1959b:9, and J.E. Rasmussen 1979:22).

A relationship between successive syllables which closes one when the other is open, so that variant forms may contain sequences of either VCVCCV or VCCVCV, has been shown to exist over a wide area, i.e. Greenland to Alaska, and suggests that this process may have held greater importance in an earlier stage of the language. The examples cited here may actually be residue of a once productive process. A related (productive) phenomenon is Schneider's Law, found in Nouveau Quebec and the Mackenzie Delta, which forbids sequences of closed syllables. Schneider's Law does not involve an exchange between closed and open syllables nor does it cause gemination, but only opens the second in a series of two closed syllables, making it progressive, unlike gemination which functions regressively.

Inuit gemination can be considered a device which compensates for a loss of phonological material later in the word, moving weight from the end to the onset of a syllable. A definition of what form this phonological material can take will need to be fairly liberal. Cluster simplification through loss of a consonant has been shown to trigger gemination; loss or elision of a syllable can do likewise. Rischel's "replacive suffixation" (1974:289-292), which I discuss for Alaskan Inupiaq (Kaplan 1981:250-254), occurs with a category of alveolar-initial suffixes which yield a series of doublets: either the suffix is added on in the usual manner, truncating a stem-final consonant, e.g. *qayali-* 'make a kayak' from *qayaq* 'kayak' + *-li-* 'make', or the stem-final consonant and its preceding vowel are deleted along with the initial consonant of the suffix, with subsequent gemination of a now stem-final consonant, e.g. *qayyi-* for *qayali-*. When replacive suffixation takes place, then, it is the elision of a sequence of V + C which appears to trigger gemination.

Gemination in Inupiaq is very old and, given its widespread presence, probably dates back to Proto Inuit. It is found even in Seward Peninsula, where Consonant Gradation has nonetheless decreased the importance of the old gemination processes through the advent of a new system which lengthens consonants according to a surface-predictable alternating pattern, since consonants following a "strong" syllable tend to be lengthened or fortis. Old gemination of the type found throughout Inuit is found in stems, usually following the first syllable, where it is a determiner of the gradation process rather than being determined by it, e.g. KI *iggawik* 'kitchen', *suppun* 'gun', and *ammit* 'skins'. Non-phonemically lengthened consonants are found in cases like *katimařut* 'they assemble', where *m* is long because of its position following a strong syllable.

In order to gain a historical perspective on gemination, I shall now consider possible relationships between gemination found in Central Alaskan Yupik and that found in Inupiaq. In the motivation of the process in the two languages, there seem to be no obvious similarities, especially if one considers the main automatic gemination rule of Central Yupik which closes an open unaccented syllable preceding a long syllable. The gemination found in inflected stems in Central Yupik, however, does resemble what we have described for Inupiaq. The geminates of *neɣɣuq* 'he eats' and *kuvvuq* 'it spills' do not precede long syllables, however, but have been explained by Jacobson (this volume) as motivated by a principle keeping stress on stems. From an Inupiaq point of view, though, this type of gemination resembles that found with replacive suffixation, where a single stem consonant is geminated upon elision of a sequence of V + C. Indeed, a stem-final ə, cf. [nəɣə-] 'eat' and [kuvə-] 'spill', has been elided along with a (historical) suffix-initial consonant found in the (CY) *-tuq* after consonants (with the allomorph *-řuq* after vowels), e.g. *niɣiřuq* 'he is eating'. If the stem-final ə and the suffix-initial C are elided together, their loss might trigger the sort of gemination found with Inuit replacive suffixation as exemplified by the pair *qayali-/qayyi-* 'make a kayak' discussed above.[8] This process serves further to close an open syllable through gemination. Although the result is a sequence of two closed syllables and not closed followed by open as in other instances, the second syllable probably does not matter in these cases, since it is final, and final syllables are typically unaffected by prosodic processes.

Any comparison of Central Yupik stem gemination with Inupiaq is of course highly speculative, and there are cases like CY *nekka* 'my house' where an analysis based on elision or replacement will simply not work, and one would be forced to find a new interpretation of the facts. If the view of the problem suggested here holds any value, it is in pointing out a possible trace of a very archaic phenomenon. Certainly, Jacobson's analysis of this sort of gemination as a process which maintains stress on the word stem accounts perfectly well for the synchronic facts.

There is additional corroborating evidence of initial syllable stress in Eskimo; for instance, Ulving (1953:45-46, 51) suggests it as a solution to an irregularity in the old Inuit Consonant Gradation

[8] Leer, in section 5 of "Evolution of Prosody in the Yupik Languages" in this volume, suggests that CY forms such as *neɣɣuq* owe their geminates to a process of ə-deletion (e.g. in **neɣeřuq*) which causes the preceding syllable to become closed through gemination of the ɣ, along with deletion of *ř* (*z* in Leer's reconstruction) because of its loss as a distinctive phoneme in Yupik.

system according to which stops failed to lenite only following an initial short syllable. When modern processes of stress assignment evolved, there may still have been a tendency to retain stress on the initial syllable, and this could be done by closing it through gemination, in Central Yupik or Inupiaq, or lengthening it in the absence of gemination and initial closed syllable stress, in Siberian Yupik. Sirenikski vowel reduction, which applies to all but initial syllables, also points to original initial syllable stress, since languages normally allow unstressed vowels to be reduced more readily than stressed vowels.

Since there is nothing conclusive to be proved about a relationship between Inupiaq and Central Yupik gemination in our present state of knowledge, I would like to conclude by mentioning insights that I hope have resulted from this look at prosody-related phenomena from the Inupiaq perspective. The only obvious phenomenon of this sort is Seward Peninsula Consonant Gradation, which is the result of close contact with Central Yupik. Yet the lenition and deletion processes themselves which are found in Seward Peninsula prove very reminiscent of the earlier Consonant Gradation system found throughout Inuit, whose functioning is closely tied to questions of gemination and "compensation" according to which what may be a canonical syllable structure is achieved. To whatever extent there existed a rudimentary prosodic pattern in Inuit, a determination of its nature will have to be based on phonological processes of the sort I have presented, the scanty evidence which an archaic system may have left behind in the modern languages.

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This list is by no means inclusive of all the significant literature on Yupik Eskimo phonology (phonetics, phonemics, morphophonemics) in general; such a list would be far longer. Instead, this list of references includes only those items which in some sense constitute a positive contribution specifically to the study of the prosodic aspect of Yupik phonology or are otherwise relevant to the papers in this volume. For the sake of completeness, however, I append in this note a brief listing and consideration of items concerning Yupik prosody which I have specifically excluded from the list because, in my opinion, they do not belong in the category just described.

Because it was so prominently published, and was the first information since Swadesh on Yupik, in a most important periodical, Anthony Mattina's "Phonology of Alaskan Eskimo, Kuskokwim Dialect" (IJAL (1970) 36:38-45) must be mentioned specially, as being seriously deficient and misleading. For example, it does not recognize the fourth vowel (ɨ) at all, takes long steps backward in thoroughly confusing stress and length, and is full of observational inadequacies and false conclusions. In this connection I feel it also necessary to mention papers by Jang H. Koo: "Acoustic Measurements of the 'Fake' Vowel Length and Degrees of Vowel Length in St. Lawrence Island Eskimo" (*Phonetica* 30 (1974): 213-220), an instrumental study of length and overlength which disregards, for example, the falling tone feature; "Vowel Lengthening in Yuk Eskimo" (*Linguistic Journal of Korea* 1 (1976): 84-88) and "What is Responsible for Consonant Gemination in Yupik Eskimo?" (paper presented at the 22nd Annual Conference on Linguistics of the International Linguistic Association, Worcester, Massachussetts, 1977; typescript, 8 pp.), are critiques mainly of Reed et al. (1977 and earlier drafts), and of Miyaoka (1970, 1971), in which the writer claims to offer improved explanations of vowel lengthening and consonant gemination. Derek Hunns's dissertation, "A Reconstruction of Proto-Yupik Phonology" (Cornell University, 1970, xii + 229 pp.), does contain at least some consideration of the literature on prosody (Hinz and Mattina, 14-16; Birket-Smith and Swadesh, 21-22; Jenness and Hammerich, 26-27; Shinen and Menovshchikov, 32-35), but Hunns's attempts to reconstruct, among other things, Proto-Yupik stress (47-51) are invalidated by his dependence on Mattina's Central Alaskan Yupik and Sirenikski stress as given in Menovshchikov 1964 without further analysis.

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